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IBM and ICL
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NEWS IN BRIEF

ICL to spend £500,000?

ABOUT £500,000 may be spent shortly by ICL on production equipment for semiconductor manufacture at its West Gorton facility. ICL has confirmed that it is currently evaluating different equipment in the ion implantation and mask making areas, and industry sources say the cost could be £250,000 apiece.

According to ICL, the equipment will be used to speed up the design turnaround of complex LSI devices (CW, March 2).

\$2m Trainer system

AN order worth £2 million has been placed with Ferranti by the Canadian Department of National Defence for a large Action Speed Tactical Trainer system. It will have 14 cubicles for trainees, an instructor's control and be based on two FM1800B computers. It is to be installed in the Canadian Forces Maritime Warfare School in Halifax, Nova Scotia.

Mael price out

REDUCTIONS by Computer Ancillaries Ltd to the prices of its Mael 4000 commercial minicomputer systems mean that a configuration with an 8K processor, a VDU, a four Megabyte cartridge disc drive, and a 120 cps printer now costs £12,975, including the company's Oasis software package.

Easypay seminar

A SEMINAR on the Easypay bureau payroll service is to be held by the Gordon and Goch Computer Group at its headquarters at 32-36 Scrutton St, London EC2 on June 21. Introduced two years ago, the service currently processes payrolls for 170 employers.

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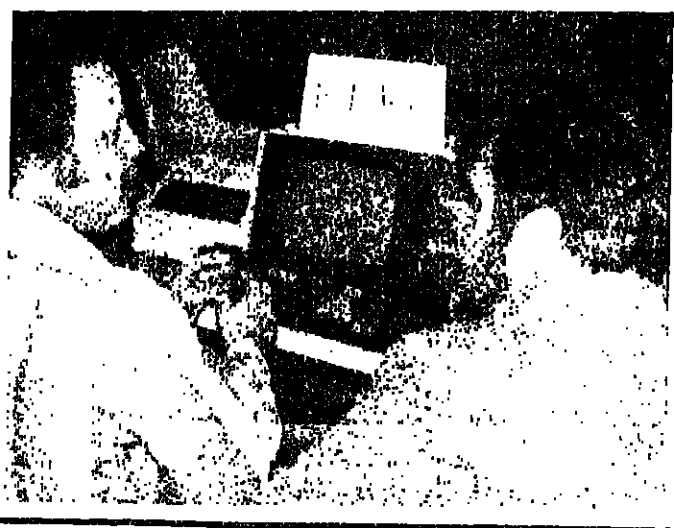
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Introducing Adam the Younger...

THE Logical Machine Corp. founded by British entrepreneur John Peers, was overwhelmed by response to the new Lomac machine, Adam the Younger (pictured right) at the NCC in Anaheim. This is a compact desk top, 16-bit processor built around eight Intel 3000 2-bit bit-sliced micros. Backed by two floppy drives giving a total of 2.5 Mbytes, and supporting a 110 cps printer, Adam the Younger is programmed in ultra-high level near natural language, and sells for under \$15,000. Three people were ready to place orders at the show.

Lomac is also a majority shareholder in Centigram, a company specialising in voice-input and response systems. Such a system was shown in conjunction with Adam in a product inventory application. It is designed for operators who need to communicate with the machine while their hands are busy. Up to 16 words or short phrases can be stored on disc for a number of operators, the voice prints being loaded into the Z80-driven voice unit at the command of the individual operator.



US offers low-cost rival to ICL Cafs

A LOW-cost rival to the ICL Contents Addressable File Store has been developed in the US by a Yale university professor. It can turn a microprocessor into an advanced parallel processor.

Starting at only \$525 for an 8K byte system, the REM S-100 was developed by Dr Sydney Lamb, initially for use in linguistic and speech recognition research.

The REM can be plugged into an S-100 bus to link to a micro and firmware is available for the Zilog Z-80 and Intel 8080 at a cost of \$35.

Dr Lamb's company, Semicon of Berkeley, California, has been in existence for only a few months and has not yet announced any orders.

Anglia's Level 66 passes benchmark

THE Honeywell Level 66 mainframe ordered by the Anglian Water Authority in preference to an ICL 2960 has successfully completed a rigorous benchmark well within schedule.

The benchmark, designed and run by Logica, formed part of the contractual conditions for acceptance of the system, including throughput, response

time, and resilience tests, it involved some two and a half man-years of development effort.

One major task was the construction of a dummy IDS-II database, accurately representing the structure of the authority's data. Logica also built a terminal simulator representing to the mainframe simultaneous activity on a network of 60 user terminals.

The order for the system, a dual 66/10 configuration, was placed last year (CW, April 28, 1977) following a long-running and much-publicised dispute. The controversy arose over a "buy British" vote by the authority's governing board.

Subsequently, Honeywell

took action in the High Court and the Court of Appeal to prevent the authority from signing a contract with ICL (CW, 24 June, 1978).

Honeywell's case was inspired partly by the fact that the published criteria for selection had not included country of origin, and partly by the fact that Level 66 is in any case manufactured at its plant in Newhouse, Scotland.

Although the legal actions were unsuccessful, the authority invited the original four manufacturers to bid again and appoint a new technical sub-committee (CW, Oct. 28, 1978). This evaluation again resulted in the selection of the Honeywell equipment.

Sweet success for Trivector

UNDER a contract worth £250,000, the UK microcomputer manufacturer Trivector Systems is supplying its System 80 computer to a consortium of 14 sugar estates in Mauritius for a data preparation application.

The first four System 80's have now been installed, two at sugar estates and the other two at Mauritius Computing Services Ltd, the central computing service for the consortium. Each system has four VDUs. Ultimately every estate will have a System 80.

Data prepared on the System 80s will be processed on dual ICL 2903/30 systems at MCS. Trivector says that the Mauritius order follows its exhibit at Compec Europe.

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NCR strike threat is lifted

THE threat of industrial action by 800 field engineers at NCR, which has hung over the company for almost two weeks, has been averted following a meeting between NCR and ASTMS representatives last week (CW, June 8).

The stumbling block had been over the salary scales to be adopted for a proposed new job grading, and it was on this that agreement was reached provisionally last Friday. It only remains for the field engineers to vote on the union recommendation of acceptance.

The grading plan is to be introduced because of the "dramatic" change in NCR's products since 1973 when the job plan currently in force began operation.

"This new plan will bring salary structures more in line with our current products," said Paul Williams, industrial relations manager of NCR. "It also gives the engineers a much better career plan and allows for more sophisticated performance appraisal procedures. After the meeting on Friday I don't believe that there is any danger of industrial action."

Although the legal actions were unsuccessful, the authority invited the original four manufacturers to bid again and appoint a new technical sub-committee (CW, Oct. 28, 1978). This evaluation again resulted in the selection of the Honeywell equipment.

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Doubts on NEB's memory venture

THE plan by the National Enterprise Board to set up a semiconductor memory plant (CW, June 1), has met with considerable scepticism.

The NEB deal was worked out with New Business Resources of Dallas, Texas, which acted for a group of engineers working in the US semiconductor industry. They will provide the management backbone for the new company, and are said to consist mainly of British expatriates. So far, however, the only one named is Dick Peritz who along with New Business Resources, was involved in establishing Mostek, one of the companies that are likely to be into 8K RAM production at about the same time the UK venture is due to get off the ground.

Commenting on the NEB plan, Jack Akerman, managing director of Phillips' subsidiary Mullard, said the cost of setting up such an LSI plant was likely to be nearer £500 million than £50 million, and others have suggested that that is "just an entry fee".

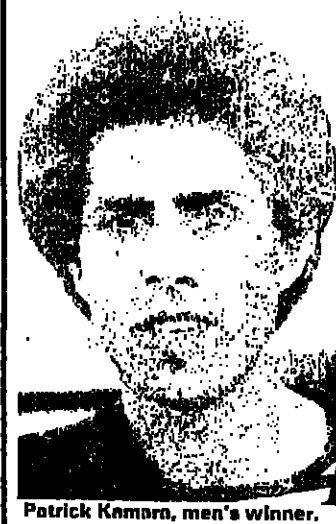
US sources indicate that a suitable water fabrication plant would cost between £14 and £17 million, with assembly and research and development costs on top of that.

"The NEB will have to face political problems. Firstly, much of the investment seems likely to go to the US manufacturers of production equipment. Secondly, assembly of the chips is usually done in cheap labour areas such as Taiwan."

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Briefing First UK Amdahl V/6

THE first Amdahl 470 V/6 to be installed in the UK is now in operation at Kay and Co of Worcester, the mail order subsidiary of Great Universal Stores. The Amdahl machine was chosen in preference to an IBM 3033 and will take over work now run on two 370/158s. Another prospective customer is the Leyland car division, BL Cars, which is considering ordering the biggest Amdahl machine, a 470 V/7.



Patrick Kamara, men's winner.

Computastars at the Palace

THE final of the Computastars competition is to be at Crystal Palace on Saturday, September 30. Book the date — it'll be a great day out for the DP department, or bring the family along to see the climax of the biggest athletics contest ever organised for computer people. Proving how popular the event has become, last Sunday's North of the Thames heat at Willesden Sports Stadium attracted more competitors than ever before. There were 31 men's teams and 12 women's teams, the largest number in any heat so far, with some keen contests in the various events.

Overall men's winner was Patrick Kamara (left) an operator with Midland Bank, and the girls' winner was Gayle May from Case. There will be a full report of the heat next week. South of the Thames report — page 18. The Computastars competition has been organised by John Goldsmith Computer Services with the support of Computer Weekly.



Gayle May, the girls' winner.

Privacy report delayed

FURTHER delays are holding up completion of the report of the Data Protection Committee, which is working on proposals for computer privacy legislation. The report is now expected to be completed and submitted to the Home Secretary by the end of July.

Members of the committee have apparently been experiencing considerable difficulty in agreeing what to recommend. There will probably be a minority report appended to the final text.

The Data Processing Management Association, soon to be the IDPM, has protested about the delay, saying that it is costly both in time and money to the association's members, who will be responsible for implementing any subsequent legislation.

A conference on computer privacy, organised jointly by the DPMA and the National Council for Civil Liberties, which was to have been held in November, is now planned for January, 1979, in order to deal with the report.

ESA installs IteI AS/5

TO improve its online information retrieval service, the European Space Agency has installed an IteI AS/5 Model 3 at Frascati, Italy. The three Mbyte machine replaces an IBM 360/65 and is said to give 100% increase in channel capacity and a 40% increase in processing speed.

It is expected that the AS/5 will have sufficient capacity for the ESRIN service until 1982 but there are options for upgrades.

APEX asks TUC to look at impact of micros on jobs

A CALL for the setting-up of a TUC-sponsored working party to look into the impact of microprocessors and microelectronics on employment has been made by the Association of Professional, Executive, Clerical and Computer Staff, this week.

The union has sent a letter to TUC general secretary Len Murray outlining its proposal, indicating that the working

party should look at the next ten to 20 years. "The present arguments around the correct strategy to be adopted with regard to the UK manufacture of microprocessors is obviously of importance," said an APEX spokesman, "but far more so are the changes which microelectronics will force in

Turn to page 2

Insac ready to buy US firms

AFTER a nine-month gestation period, the assault on the US software market by Insac, the National Enterprise Board's subsidiary, is about to bear fruit. Negotiations for three major developments, at contracts are near to conclusion and the company is talking to several US software houses with a view to a takeover. Insac has been seeking a major development contract for each of its three software house members, CAP, SPI and SDL. The fourth

member, Systime, is not at present seeking to enter the US market. Contracts in the fields of interactive graphics, X25 packet-switching technology and language technology are likely to be signed shortly. "The contracts we are negotiating for our members are in the \$3 million to \$5 million range, typically involving 15 to 30 people full-time for two to three years," says Insac Group Inc. vice-president, Insac Group Inc. told CW.

Licensing idea

LICENSING of engineers should be handled by the Engineers' Registration Board of the Council of Engineering Institutions, according to the CET's recommendations to the Plinistion Committee investigating the engineering profession. The council also recommends new four and five year degree courses for engineers, with the extra year consisting of training in industry, for students aiming for managerial posts.

IBM profits

IN the UK last year IBM increased its pre-tax profit by 27% to £110 million on a turnover of £578.8 million, which itself was up 17%. Profit after tax was £56.9 million, and £39 million of this was added to reserves. Exports accounted for about half of the business at £263.7 million.

3000 lpm printer

A LINE printer that can run at 3000 lpm, the Impact 3000, has been introduced by Decimatech. The IBM compatible Impact 3000 has an integral microprocessor based controller and employs an alloy print hammer that brings contact time down to 17 millionths of a second. Characters are held on a print band that can be changed in less than two minutes.

Protest lost

THE local authorities' management services and computer committee, Lancashire, is to be told that the protest over the loss of the Post Office Prestel service is lost. It will participate in the service to determine whether the system will prove a more effective method of distributing information to local authorities than existing channels.

Millions package

A WORLDWIDE software package for the Multibus bus computer has been introduced by Allied Business Systems. Called Multibus, the package allows the Multibus to be used as a shared logic screen and processor with centralised

Low-cost French rival to ICL's DAP

A PARALLEL processor that costs considerably less than ICL's distributed array processor (CW, April 13), has been introduced by Cimss, an affiliate of the French minicomputer manufacturer, SEMS.

Called Propal II, the system now coming into production has an array of 128 processors, compared with 4,096 in the DAP. ICL plans to sell each processor in Propal II as 16K bits of memory, while the DAP processors will have only 4K bits.

Data can be transferred between the Propal processors in 10-bit streams. The 128-processor Propal II costs £60,000 FF (about £70,000) compared with £500,000 for a 4,096-processor DAP, and while DAP has to be hosted by a big 2900 mainframe, Propal II is designed for use with a SEMS Mitra minicomputer. This is claimed to make the total cost of a working Propal II system more than about 1.2 million French francs.

The design of Propal II is such that it could be expanded to have 2,048 processors, each with a 16K-bit memory, which could make it considerably more powerful than the DAP in certain applications.

Services up

COMPUTER services worth £72.4 million were sold in the fourth quarter of 1977, bringing the total for the year to £288.5 million, up 20.3% over 1976, according to the latest bulletin from the Government Statistical Service.

Also

Computers in the security office

Services up

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COMPUTER WEEKLY'S INSIDE NEWS

To leave or buy? This is a decision that many computer users when additional equipment has to be acquired. In this week's feature section various aspects of leasing and the second hand market are discussed (Pages 12/15).	12
Advising in computer systems selection is a complex task. In this week's feature section, John Barrett, formerly of the UK's largest computer rental company, offers some advice on the use of digital information and machine intelligence (Page 17).	17
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THE future of the world, as seen through the eyes of IBM, is an irresistible topic for any speaker and a guaranteed attention-grabber at any conference.

An original and challenging thesis on the subject was presented to Shadow II users at a London conference by Richard Currier, marketing vice-president of Altergo Inc.

We should, he suggests, forget about E-series and H-series, and

Leading into the electronic office

concentrate on word processing instead.

Noting that no new releases of Systems Network Architecture or IMS are scheduled, he deduces that IBM is hard at work re-writing them with a word processing slant and a 1980 deadline. He suggests that the result will be software which marries word and data processing, leading to an IMS database simultaneously used for text storage and numeric retrieval.

Satellite Business Systems, in which IBM has a one-third stake, is a major element in Currier's thesis. Satellites, he suggests, are really cost-justifiable only when they transmit large volumes of data or text.

Currier believes that IBM, with some 50 per cent of the

typewriter market, has spotted that it can make its next fortune out of giving those charmingly inefficient typists the tools to improve their productivity.

His idea of a large company's entire filing system being retained in some enormous electronic filing cabinet is probably quite feasible, given the phenomenal rate of decline in the cost per bit of hardware.

There is plenty of evidence that IBM is preparing to lead us into the era of the electronic office. It is noteworthy that the company demonstrated to the Press in Nice last year that the 3750 telephone-switching system could become the missing link in an electronic mail network of word processors and link-jet printers.

Nevertheless, it is unwise to go overboard on any one product or scenario; IBM never does. Currier contends that transaction processing and time sharing are passing fancies, but IBM's history suggests that it can be relied on to continue to offer strong products for these markets for as long as the fad persists — and indeed, is currently emphasising the VSPC time sharing software.

It is certainly worth keeping a close watch on IBM's strategy in the office products market, but the E-series should not be written off. There is little doubt that it will be with us within months. As for the H-series, something fairly enormous will be required to store all those files, even if the databases are distributed.

One development under way at IBM not mentioned by Currier, but perhaps relevant to his thesis is the System R relational database, reported to be under test at Boeing Computer Services. System R sounds like just the thing for the company which has everything and needs to keep track of it somehow.

Call for setting up of world telecoms authority

THE establishment of a world telecommunications authority to rationalise and standardise communications laws, taxes, tariffs and equipment was one of the possible future developments discussed at the first full meeting held under the auspices of the Brussels Mandate.

It took place in London last week and was attended by legal and communications experts from organisations on both sides of the Atlantic, including the UK Post Office, the French PTT and the US telecommunications giant AT&T.

The meeting was organised by the Washington-based lawyer

club would be to make its deliberations public knowledge by having the minutes of its meetings generally available.

"The third aim is to initiate studies into the laws in various countries relating to things that affect transnational dataflow like privacy. The actual studies would be carried out by academic institutions and other suitable bodies."

"The meeting also decided that there was a real need for a much clearer distinction to be made between different kinds of internationally transmitted data, in order to separate data, as a commodity from information in the broader 'humanitarian' sense."

"But before we can persuade national governments to change their telecommunications laws and tariffs, a lot more people need to be involved in this debate."

Multinational companies with representatives at the London meeting last week included Control Data, Digital Equipment, Unilever, Manufacturers Hanover Trust, American Express and Massey-Ferguson.

Some of the other organisations represented were the Home Office, the Inter-Bank Research Organisation, the US Senate Foreign Relations Committee and the Italian inter-governmental bureau for information.



JOHN EGER... the club should have three main aims.

and telecommunications expert, John Eger, one time telecommunications adviser to Presidents Nixon and Ford.

He came up with the idea of an informal club for influencing world communications policy at the Online conference held earlier this year in Brussels, hence the name, Brussels Mandate.

Commenting on progress at the first meeting, Eger told Computer Weekly, "Part of the purpose of this meeting was to define the role of the Brussels Mandate, and the consensus was that the club should have three main aims."

"One of these is to have several ongoing meetings each year at locations all over the world with no more than about 30 attendees at each. Typically, half of them would be telecommunications consumers, like multinational companies, another quarter government representatives, and the remainder academics."

"As time went by people from the developing countries could be drawn into the meetings along with smaller telecoms consumers."

"A second basic aim of the

Swiss companies seek to buy name of UK software house

By Tim Palmer

SEEKING to take advantage of an extraordinary provision of UK company taxation laws, a group of Swiss software companies wants to buy a UK software house.

Once acquired, the software house would immediately cease trading in the UK, and would in turn take over the Swiss group, which consists of 14 companies trading in France and Germany as well as Switzerland.

In effect all the British company would be selling is its name, registration and reference list of clients.

In former owners would be free to set up a new company with a different name and continue in business as before, and would be paid "good money" by the Swiss group.

They seem a little strange that anyone is prepared to pay good money for little more than a name, but it appears that if a company is registered in the UK but makes no overseas, it is not subject to UK company taxation. Apparently the 14 companies will also be free from tax in the countries in which they operate.

Why not simply set up a new British company

rather than acquire a ready-made one? In order, it seems, to ensure clients that they are dealing not with some fly-by-night operation but a solid and established British company with a ready-made list of customers.

The quest for a suitable British company is being handled by RAS System Design of Brighton, which says that it is already holding talks with a software house which is in liquidation. RAS says that the whole idea has been discussed with the Inland Revenue.

The group, which is already based in a remote valley in Switzerland where taxation is very low, is also planning to go into personnel recruitment in a big way.

The plan is to set up a database of computer staff, both freelance and currently employed but prepared to move, in order to provide a service to users who need to build up a large staff quickly.

A major recruitment effort will be made in the UK where it is hoped to find people willing to take jobs, typically much better paid, in continental Europe.

Welsh councils opt for ICL 2972s

FOLLOWING the announcement by Oxfordshire County Council (CW, June 8), that it is to install an ICL 2972, two other local authorities, Mid-Glamorgan County Council and Cardiff City Council, have said they are to follow suit and replace their ICL 1904S systems with 2972s.

The orders are worth £3.6 million to ICL and both computers will support a wide range of online terminals.

At present, Mid-Glamorgan County Council provides a remote job entry service to Ogwr, Rhondda, and Taff Ely borough councils and its other terminal users include the South Wales Police Authority. The

Welsh Joint Education Committee, plus a number of schools and county council technical departments. Applications include an examination processing system for the WJEC as well as files, fees and maintenance for magistrates' courts.

Cardiff City Council 2972 will provide computing services to South Glamorgan Borough Council. The system will also support terminals in schools throughout the county and in the South Glamorgan Institute of Higher Education.

Cardiff's machine, valued at £1.7 million, will be installed in March, 1979, and will feature 3 Mbytes of memory and 10 disc drives. The Mid-Glamorgan system will be installed in June, 1979, and will have 10 Mbytes of memory and 14 disc drives. It is valued at £1.9 million.

The Oxfordshire County Council 2972 will provide computing facilities to all five districts in the county and it has been estimated that the switch from an ICL 1904S to a 2972 will result in a saving of more than £500,000 over seven years. This system will have 2.5 Mbytes of main memory.

The London Borough of Southwark, one of the founder members of the Joint London Borough Computer Consortium, which has now virtually disbanded (CW, March 30), is to

CIH-HB takes control of French micro firm R2E

MOVING as planned into the microcomputer and terminals fields, CIH-Honeywell Bull has taken a controlling interest in French microprocessor pioneer R2E. The move has given the micro company an injection of FF2 million, about £240,000, which it needed for expansion and development projects.

CIH-HB is expected to increase

its share of R2E to about 60%, but the company will remain technically and commercially independent under its founder, Vietnamese-born Thi Truong.

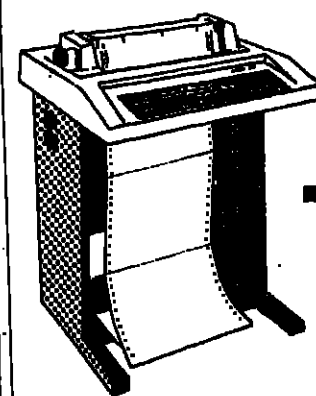
R2E is looking for a turnover of FF28 million this year, up from FF22 million in the year to March, 1978, and has just opened a US subsidiary in Minneapolis.

Motorola to enter market for firmware interpreters

PLANS to enter the market for firmware interpreters and applications packages for use with microcomputers are well advanced at Motorola. Gary Daniels, director of MPU design of the company's Austin, Texas, plant, says a 34K bit ROM is being developed that incorporates an 8K byte Basic interpreter. Plans for firmware applications packages are at present less well advanced because the market is as yet undefined.

One major problem is that the microprocessors used in systems employing firmware chips need a position independent code. This is an important factor for without it the device manufacturer becomes involved in the design of the system as well as the components. Currently, according to Daniels, few microprocessors allow position independence. One that does is Motorola's 6800 processor and another will be the 68000 MACS (Motorola Advanced Computer System) to be introduced shortly. This 16-bit device will be equipped with 32-bit internal registers.

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Ten years ago...

COMPUTER WEEKLY
JUNE 20, 1968

IN SPITE of opposition, a computer "with significantly better throughput than Alder" was to be built at Manchester University with the help of a £250,000 grant from the Science Research Council. Evidence produced by computers was to become admissible in Scottish civil courts under two new clauses proposed by the government in the Law Reform (Scotland) Bill. Flight testing of the RAC 111-500 series engine was being helped by the use of an Elliott 803 computer. Air Canada placed a digital display systems order worth £12 million with Raytheon for a seat reservations and communications system. The rapid identification of fingerprints by computer using pattern recognition techniques was being studied at Strathclyde University. A computerised system controlling the distribution of natural gas throughout the UK was to be developed by the Gas Council.

INTERRUPT

ONCE upon a time a very large British company was proudly, and nervously, demonstrating its new sales application to all the important people in selling from its offices all over the UK.

This was in the days of the immortal IBM 1401, and just about the first big application this very large company had ever developed. Everybody was there including a very young, and very raw, programmer.

In the middle of the invoice run the entire system stopped for no apparent reason. Team leader Frank and all his men ran round in circles looking for clues until, having reached that state of desperation when anything will be tried, somebody hit the start button on the line-printer, and it all went like magic from then on.

Nobody ever knew that the young, raw programmer had been leaning on the line-printer and had bumped the stop button with his elbow; nor did he ever say — until today.

The Moral: Keep them out of the computer room while they still don't know where their elbows are.

© The week's 26 Interrupt Prize goes to Gary Harrison of Belfast.

Itel Laser Printer: read the facts.

See page 13

DOWNTIME

by Chad

Read it and see

THERE is an oft-told tale about some monks in the Middle Ages who were trying to determine how many teeth a horse has. They pondered, they theorised, they searched exhaustively through Scripture, but still could not agree. Then one of their number suggested looking in a horse's mouth and counting the teeth.

The other monks were horrified, appalled. They chastised their colleagues severely for making such an outrageous suggestion. Nowadays, of course, we realise how primitive and irrational they were. Nobody thinks like that any more, right?

Wrong. General Motors in the States, suspecting that its technical manuals may be difficult to read, has devised a computer program that calculates the average sentence length and word length in a piece of text and comes up with an index of "readability." Manuals that score badly are rewritten (by a human being).

Here is a passage that failed the test: "If your vehicle is equipped with a stowaway spare tire, your spare is designed to provide you with more usable interior space. The spare is located in a deflated condition resulting in a reduced overall diameter."

After rewriting, it became: "If your car has a stowaway spare tire, your spare provides you with more usable storage space since it is stored deflated."

The mind reels. If you want to know if something is readable, you don't stick it through a computer, you read it. Writing style is a wholly subjective thing, and no amount of computer analysis will make up for writers who have no aesthetic sense of how to communicate. The thought that there are people at GM who write phrases like "located in a deflated condition" and are paid for it is painful.

Why don't they just say it saves space to let the air out of the spare?

Keeping it clean

In the world of high technology, keeping it clean is a serious business and the latest aid for keeping mucky people and clean components apart is this chic little number from Tak Chemicals.

The one-piece romper suit for adults is, I am told, made of a special non-woven fabric which is a much better bargain than more expensive woven material, and there are tunics, trousers, smocks and other gear to suit the occasion. As well as protecting the lad inside from all sorts of industrial hazards Confidant—that's what it's called—will also retain "body and undergarment debris".

And after a hard day at the lab you could trot off to a fancy dress ball as an abominable snowman.

Of mice and machines

FIRST heats of a worldwide micro-mouse contest, organised by the Institute of Electrical and Electronic Engineers, were held at the NCC at Anaheim. Contestants build a mouse from micro components and it has to find its way through a maze.

Although over 6,000 people have entered the 1978 competition, the organisers expected only about 800 eventually to turn up with the workable mice at heats to be held throughout the year.

At Anaheim, many of the entries failed to reach the starting gate and there were many aborted runs. One mouse, for example, kept getting as far as the first bend and then going back home.

THERE will be significant progress on the development of standards for open system interconnection during the next fortnight with meetings being held in Washington, Paris and London by three specialist groups

working under the auspices of the International Organisation for Standardisation. UK participation in these studies is the responsibility of a British Standards Institution committee known as DPS/20. This

article emphasises the need for standards in this area and outlines the technical approach being taken. It was prepared on behalf of DPS/20 by a group chaired by Dr Roland Rosner.

Standards for open system interconnection

OPEN System Interconnection is the notion that any computer program, terminal or user may communicate meaningfully with any other. The advances being made in computer communications technology now make such a concept feasible but only if the appropriate standards can be specified and universally adopted. This article outlines some of the benefits to be derived from open working and describes the work being undertaken by the standards organisations towards this end.

The property of "openness" is intrinsic to any general communications medium such as the postal and telephone services. The advent of new public data networks creates the possibility of extending such openness into the area of computer systems. This could lead not only to enhanced use of existing facilities but also to the introduction of a wide range of new applications such as the "cashless society", electronic mail and home computing. Users will be able to access an ever-increasing number of services from the same terminal equipment; information will be readily exchanged among different machines; tasks may be performed by partitioning them for execution on several co-operating computers; databases and access to them may be geographically distributed.

Historically, it was the need to access powerful mainframes and centralise databases which stimulated the development of computer communications systems. This led to the concept of the familiar star network with a number of remote terminals around a central computer. Within such a closed system, the computer determined its own rules to be obeyed by all the terminals and intelligent devices requiring access. The result has been a proliferation of proprietary conventions which have very little in common with each other.

Two parties wishing to exchange data or to access shared

information could agree among themselves on the conventions to be used. But such bilateral arrangements become unmanageable and expensive as the number of interconnections increases, thereby severely limiting the range of applications.

Advances in computer and communications technology now make distributed systems technically feasible and economically attractive. However, whereas standards in areas such as card codes are a convenience when decks are moved from computer to computer, open system interconnection is absolutely impossible unless the appropriate standards are specified and implemented.

If standards are not agreed quickly then pressures from powerful customers will force manufacturers to adopt less than ideal de facto solutions. The telecommunications industry which sees in open working the possibility of immense extensions to its business realises the importance of standards in bringing this about. The administrations of the new public data networks have indicated through their international or regional CCITT that they might take their own steps if there is undue delay by the standards bodies.

The British Standards Institution was among the first to realise the importance of standards for open system interconnection and last year proposed to the International Organisation for Standardisation that the subject merited the establishment of a specialist sub-committee. The proposal was accepted and the ISO Technical Committee 97, which handles standards for computing, set up a new group with the formidable identifier ISO/TC97/SC16. To co-ordinate work, BSI/DPS/20 was formally established as a sub-group of the BSI Data Processing Committee. DPS/20 is now actively engaged in its work and has identified an initial set of topics to be studied

in depth by its working groups. At the recent meeting of ISO/TC97/SC16 in Washington, the sense of urgency generated a welcome spirit of international co-operation and a realisation that, to be more manageable, the subject should be divided into three smaller areas. These three sub-groups will cover all the subject matter of the UK working groups.

Over the years, the approach taken towards the construction of computer operating systems has gradually evolved to become one in which individual functions are performed by well-defined modules or groups of modules. The overall structure is "layered" in such a way that the functions provided by one level can be utilised by higher levels.

manner which is independent of the nature of the transmission medium, which could be, for example, an X25 network.

The operation of a protocol begins with the establishment of a channel along which information is to flow. This is followed by a negotiation phase when the rules governing subsequent interactions are agreed. During the transfer phase, data is exchanged together with signals which assist in the control of errors, synchronise the data flow or permit the rules of the dialogue to be modified. The end of the transfer is effected by terminating the dialogue and closing the communications channel.

DPS/20 is concerned with the specification of the transport service and the applications level protocols.

Areas of study are: Refinement of the models: One of the DPS/20 specialist groups is studying the details of the model with a view to specifying a unified set of concepts and definitions which will form the basis of the other studies.

The Transport Service: Another group is concerned with the functions of the Transport Service and the definition of its interfaces with the communications and applications layers. The nature of the Transport Service when the communications medium is an X25 network will also be studied.

High Level Protocols: The components of the applications layers will be subjects of study for a long time. DPS/20 is initially concentrating on basic protocols upon which more elaborate structures may be built later.

File transfer protocols permit the transmission of bulk data among computing systems. Several such protocols have already been defined including a contribution from the UK High Level Protocol Group. These are being examined with a view to extracting the best features of each for synthesis and expansion into a possible standard.

The concept of the virtual terminal has been developed to overcome communications problems caused by incompatibilities among the large number of available terminals. Its purpose is to make it unnecessary for components in applications layers to cater for the details of the particular terminals with which they are communicating.

In parallel with the work of specific protocols, a study, closely related to the elaboration of the model, is in progress on the common features of all high level protocols. If this can be determined, it will be easier to define and implement future protocols.

Because the issue of open system interconnection has only recently gained wide prominence, DPS/20 recognises the need to produce some descriptive material about its work for the wider community likely to be interested in or affected by the topic. Accordingly, one of its sub-groups has been assigned the task of preparing information for this purpose. This note is the first of its kind and further reports will be issued as the work proceeds.



Dr Roland Rosner is a principal scientific officer at the Rutherford Laboratory and a member of the Network Unit of the Computer Board and Research Councils.

Further, no level need be aware of the detailed mechanisms for achieving functions at any other level. This allows the construction of the system to be undertaken by several groups working in parallel, provided only that the interfaces between modules and levels have been rigorously specified beforehand. A further advantage is the ability to replace modules and levels when hardware is changed or when more efficient software is available without disrupting the total structure.

Microwave links for Leyland factories

MICROWAVE links providing data communications at 56,000 bits per second are part of a network that connects more than 30 factories and depots of Leyland's BL Cars group to a data centre at Redditch, near Birmingham. The centre, which was officially opened on Monday, is taking over mainframe processing work handled until now by machines that include twin IBM 370/158s at Cowley, Oxford; an IBM 370/145 at Solihull, Warwickshire; and an IBM 370/145 and 370/158 at Longbridge, Birmingham.

NEWS IN BRIEF

LT £50,000

modems order

TO use its private telecommunications network for data transmission, London Transport has placed a £50,000 order with IAL for dial-up and permanent link modems.

At present data transmission is via Post Office modems on the public switched telephone network.

NCR additions

THREE additions to its 7750-2000 family of proof and encoding systems for banking have been announced by NCR. Known as the 7750-2300, 7750-2400, and the 7750-2500, the new models offer increased power and additional capabilities to NCR 7750-2000 series users. They are stand-alone systems which can be upgraded to operate as workstations for the NCR 7750-3000 distributive document processing system.

Standards agreed

RECOMMENDATIONS on standards for the exchange of bibliographic information have been agreed at a symposium in Sicily, between representatives of abstracting services, libraries, the ISO, and the UN. The symposium agreed that a common exchange format should consist of a record structure, content descriptors, and data elements, and that the record structure should be accepted as the existing ISO 2709.

Plessey venture

TWO Plessey companies, Plessey Ireland and Plessey Electric, formerly East Anglian Electric, have been appointed agents for telephone, telex and facsimile terminals communicating via Marisat satellites operated by Comsat General of Washington DC, and working on offshore oil exploration around the coast of Ireland. Plessey will market, install, and maintain the terminals.

Prime installation

GECS, the Liverpool-based computer bureau, has installed a Prime 300 system for use in batch and time sharing applications. The bureau offers a range of accounting and general computing services to companies, and has developed commercial, mechanical and electrical engineering software.

Biscuit system

BISCUIT makers Chiltonian of South London has ordered a £200,000 132K byte CIL 8050 to handle accounting procedures, order processing and stock and production control.

Service company for lawyers

A NEW company, Oyas Computers, has been formed to handle all the legal and systems development services provided for lawyers by the London Law Stationery Society. In particular, it will provide the society's automated online legal accounting system.

When the centre at Redditch is fully equipped by the end of the year hardware there will include one six-Megabyte IBM 3083 and four machines transferred from other locations — two 370/158s and two 145s.

There will also be a total of 20,000 Megabytes of online disc storage on 80 Memorex removable spindles and 12 Memorex fixed head units, making BL Cars the biggest Memorex user in Europe.

BL Cars has also gone to Memorex for the processors that front end the network and to Data 100 for the 30 minicomputer-based remote job entry terminals that provide users with what BL Cars calls "decentralised control", even though the mainframe hardware is centralised.

About 130 other terminals will be used for time sharing by development personnel at various locations, for database access and for text processing. To support these applications the systems at Redditch will run TSO, Time Sharing Option, IMS, Information Management System and CICS, Customer Information Control System, as well as Hsp, which controls I/O for the Data 100 terminals.

A microwave tower on top of the Redditch centre provides voice, facsimile and data links with almost all the locations in the BL Cars network, while ordinary Post Office land lines provide back-up.

BL Cars says that it is one of the few privately licensed users

Stockport and Gwent magistrates in lead

MAGISTRATES' courts in Stockport and Gwent are to be among the first courts to implement ICL's recently released Magistrates' Court System.

Magistrates' Courts' Court is to use an ICL 1804A system operated by Stockport Metropolitan District Council to run the package, and court staff will access the system via three ICL 7561 VDUs installed at the court and linked to the main computer through a 7502 terminal processor. This system will eventually replace a Burroughs visible record computer.

It will also help to clear a backlog of £200,000 worth of outstanding fines.

Magistrates' courts in Gwent will use an ICL 2903 system with five 7502 and two 7181 terminals to run the software package, and the order is valued at £160,000.

The 7502's will be installed at magistrates' clerks' offices in Newport, Bedwellty, Cwmbran and Uxbridge and will be linked to the 2903 in Newport. Police in Newport will have a 7502 while police in Blackwood and Pontypool will use the ICL 7181 terminals.



MD of DRE

FOLLOWING its formation earlier this year (CW, January 19), Data Recording Equipment now has a managing director. He is John Armstrong, formerly managing director of GEC-Elliott Process Instruments Ltd. Armstrong has also joined the board of Data Recording Instrument Co which controls DRE and two other companies, Data Recording Heads and Newbury Laboratories. DRE embraces all the operations covered by DRI before its status was changed to that of a holding company. Products manufactured by DRE include floppy and cartridge disc drives and matrix printers.

Conflicting views on ICL shares

WHILE investor confidence in ICL remains strong, with the shares tending to rise with the market and to stand firm when it falls, two stockbrokers' reports on the company take strongly contradictory views.

Quiller Hiltion Goodison & Co recommends its clients to hold the shares, noting an encouraging outlook for the second half of the company's financial year and forecasting pre-tax profits for the full year of £37 million.

It rates the first half performance — pre-tax profits of £15.8 million on turnover of £232.1 million — as creditable, given the industrial relations problems of the October to December quarter, says that real growth continues at 20%, and attributes the increased interest charges (£5.8 million in the half-year) to stockbuilding of 2850s and 60s for delivery later this year and next year.

It also puts into perspective the adverse government report on the performance of some large 2800s, pointing out that it is "by no means unusual for early installations of a completely new computer to encounter teething problems that take some time to resolve", adding that ICL is confident that no fundamental problem exists and that the government is satisfied with the steps that have been taken in the three or four installations where problems have arisen.

The view from Scott, Goff, Hancock is decidedly bleak, and recommends clients to take advantage of further strength in the share price to reduce their holdings.

"The bulk of ICL's problems lie with its software development programme, and profits reported are largely due to smaller machines where software is less important. Our fear is that price cutting will ultimately extend to this market segment, especially as IBM will be launching its new E-series shortly."

"ICL should report a useful pre-tax profit increase this year, but the fundamental position is still fraught with considerable uncertainty," it concludes.

● ICL shares broke through the 300 pence barrier last week. They stood at 208 pence at the beginning of the year.

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The expert system for this same ending differs from the database in many ways. In-

Donald Thine

Donald Thelme

However, facilities are included for concurrent program development and batch processing, the latter being described as a system task.

100-443887-100

A DATA preparation service has been introduced by Sharpe Bennett Associates, based on its old offices at Lancing, Sussex. Formed 2½ years ago to design and program commercial systems for small-to-medium computers, the company has moved to 1 Aldsworth Parade, Goring-by-Sea, Sussex. Tel: Worthing 503848.

A GENERAL ledger system designed for financial management has been launched by K3 Software Services, of Worcester. Written in Cobol, the package will probably be of most interest to existing mainframe or minicomputer users, says the company. K3, a subsidiary of Kalamazoo, was formed earlier this year (CW, January 12).

ALOG

Simplifying the interface

If given the go-ahead, CPE is likely to offer a reduced rate to individual members, probably offering 10 initial programs for a subscription of £10.

Starting in September, the CPE is to publish a series of booklets describing the programs available in each subject area. Dr Beech noted that the scheme is thus offering academic recognition to program authors for the first time in the history of program exchange.

THE latest addition to the range of software offered by the National Coal Board's Compower subsidiary is a system for the design and evaluation of multi-ended pipework systems.

The system, Pipestress, is available on the Compower network under a marketing agreement with Babcock and Wilcox, which developed the program suite.

Greatly improving program legibility, the facility for longer names has so far appeared in

A SOFTWARE package designed to simplify the interface to IBM's VSAM has been adopted by a South Coast consultancy for marketing in the UK. The software, Vsamio, was developed for a major Swiss bank by Utesia AG and is said to have been installed at 40 sites in Switzerland, West Germany and Austria.

Vsamio supports all three types of VSAM data set, replacing IBM's more complex user-program interface with a single Call instruction. Based on a general-purpose module with a single entry point, the VSAM operations required are specified using link area parameters.

The interface enables inexperienced programmers to make full use of VSAM facilities without having to master the cumbersome IBM calling sequence, according to the company. In addition, for Cobol users, it eliminates the need for

IBM's chargeable Cobol VSAM feature.

VSAM offers a number of throughput advantages over ISAM, including reduced access degradation as files become disorganised, and a consequent reduction in the frequency of reorganisation.

Marketing agent for Vsamio in the UK is RAS Systems, sign, 48 Portland Avenue, H. Syssec. Tel: 0273 411109.

Both BOY and GIRL are prime numbers. See page 53 for solution.

After General Strategy, the second technique is Implementation and Tactics. This involves

De Bono felt that no one type of person found LT easier, though he did suggest people who think visually may do bet-

NORTH AMERICAN BUREAU OFFICES: Irvine, CA (714) 952-7600; Los Angeles, CA (213) 477-4400; Monterey View, CA (415) 962-4000; Dallas, TX (214) 343-7400; Houston, TX (713) 865-4400; New York, NY (212) 691-6100; Philadelphia, PA (215) 261-2200; Chicago, IL (312) 467-1300; Washington, D.C. (202) 462-4400; Minneapolis, MN (612) 338-6100; Portland, ME (603) 886-2200; Seattle, WA (206) 465-2200; Toronto, Canada (416) 881-0711.



PLESSEY
PERIPHERAL SYSTEMS

[illegible]

Enhancements to Philips' WP 5001

FIVE enhancements have been introduced for Philips WP 5001 word processing system. Communication facilities have been added, enabling the machine to communicate with other WP 5001 systems over the dial-up telephone. IBM and with IBM and Philips miniframes. The Qume 28-inch carriage of people wanting to use the machine and stacker is now available, and accepted notepaper to be fed continuously through the high speed printer. The WP 5001 also now offers Optical Character Recognition facilities, enabling it to handle output from any typewriter with OCR heads. Offline punching of paper tapes for telex transmission is now supported by the WP 5001, enabling text to be corrected on the screen before it is committed to tape. The WP 5001 series of word processors will be enhanced later this year with the addition of a floppy disc-backed model based on the system developed by Microm, a Canadian company in which Philips has taken an 80 per cent stake (CW, May 4).



The Philips WP 5001 word processing system.

CTL adds to top of its 8000 series

A DUAL-PROCESSOR system has been added by Computer Technology at the top of its 8000 series. Called the 8070, the new machine consists of two 8050 processors tightly coupled together and is claimed to offer up to 80 per cent more power than a single 8050. It runs under the standard Modus operating system which supports concurrent multilingual transaction processing, batch and spooling from both local and remote terminals. Languages available from CTL include Cobol, Fortran IV, Basic, Coral 66 and BCPL. There is also an Algol 68 compiler, and Manchester University has developed a stand-alone Pascal which does not run under Modus.

Redifon wins £2m 'R' orders

ORDERS worth well over £2 million have already been placed with Redifon Computers for the R-range of distributed processing systems that it announced in April (CW, April 13). Customers in the UK include three local authorities.

More than £500,000 worth of the orders for the R-range have come from Czechoslovakian customers including Bastro, an engineering factory, part of a coal mining organisation in the Ostrava area; and Synthesia, a large chemical factory at Pardubice.

The local authorities which have ordered R-range systems are the London Borough of Lewisham and Rotherham Borough Council, both of which are having R300 systems with 12 terminals; and Doncaster Metropolitan Borough Council.

Versatec introduces vector to raster converter

AN electrostatic plotter can be driven by a minicomputer at full speed using the vector and raster converter, introduced by the US firm Versatec, which has a UK subsidiary at Newbury, Berkshire.

The VRC is a 5 1/2 x 19 x 20 inch box unit and has been designed to accept ordered vectors from a minicomputer and to send raster data directly to the plotter.

EXPANDING its operations in the City, Honeywell has opened a third outlet for the GE Mark III time sharing service, which is handled by its Network Information Services Division. The new office at 74 Finsbury

Pavement, EC2, also houses a training centre and support services for software and financial applications. The division has also introduced Tabol 2, an enhanced version of Tabol, which has been developed for the examination of alternative business strategies and is designed for use by business managers with no DP experience.

Honeywell says that with Tabol 2 it can offer across-the-board data handling services for management. It is introduced as Honeywell takes a bigger interest in the worldwide Mark III operation with a 16 per cent share in a new company set up to sell the network (CW, June 15). GE owns the remaining 84 per cent.

The VRC converts vectors to rasters at data rates of one Megabyte per second.

It is introduced as Honeywell takes a bigger interest in the worldwide Mark III operation with a 16 per cent share in a new company set up to sell the network (CW, June 15). GE owns the remaining 84 per cent.

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NEWS IN BRIEF

ICL 2950 for patients

ONE of the earliest ICL 2950 installations is to be for Private Patients Plan, the medical insurance group which will take delivery next month. It will replace an ICL 1901T and handle the updating of company group subscriber files. ICL was chosen again because PPP is already successfully using an online system called Computer Retrieval and Entry of Subscriber Transactions which is based on an ICL 7502 terminal processor system.

Quicker delivery

NEXT-DAY delivery is now being offered by the Idem Division of Wiggins Teape for Idem carbonless paper and other Wiggins Teape products following the installation of an IBM 370/148 at its Basingstoke headquarters. The £1.25 million system will be linked to warehouse and branch office VDUs.

Footwear system

TO deal with bought, sales and nominal ledgers a Redac Executive system has been bought by Twinnar, the retail footwear company of St Albans, Herts.

OEM disc drives

A RANGE of fixed media disc drives, the 2700 Series, has been introduced by Storage Technology, which now has an office in London. The three models in the series, the 2707, 2710 and 2720, have capacities of 33, 80 and 170 Megabytes, respectively. They are aimed specifically at the OEM market, and feature a cooling system that enables them to be used in virtually any environment.

Survey research

RESEARCH into the compilation of surveys is to be carried out by a new unit at the Polytechnic of North London, with the aim of developing an integrated approach to theory and applications of surveys in the social sciences. Development of software for statistical analysis will be one of its main concerns. Among its work so far has been a national survey of schoolgirl pregnancy, and a programme of research into the "quality of life" is planned.

Codex buys Toronto firm

US MODEM manufacturer Codex has gained access to the Canadian market by purchasing ESE of Toronto. ESE already manufactures a small range of modems, and this will be enlarged greatly by the Codex range. Codex will save on the 17 per cent duty which is imposed on imports if a similar product is made in Canada.

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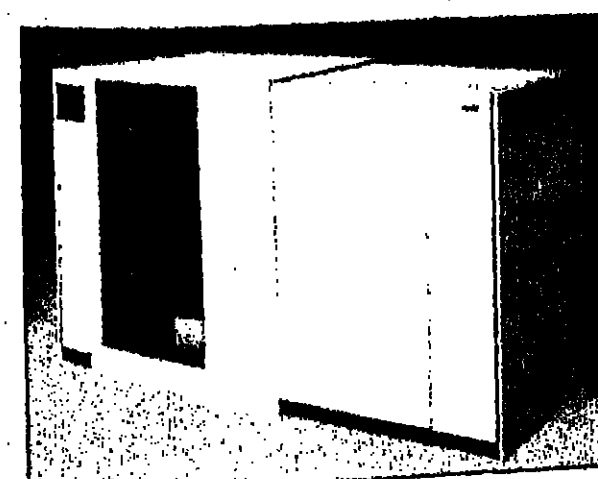
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- ★ Buying and selling of all IBM Hardware

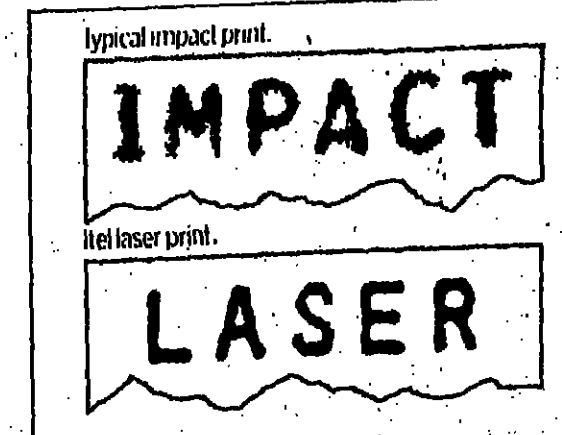
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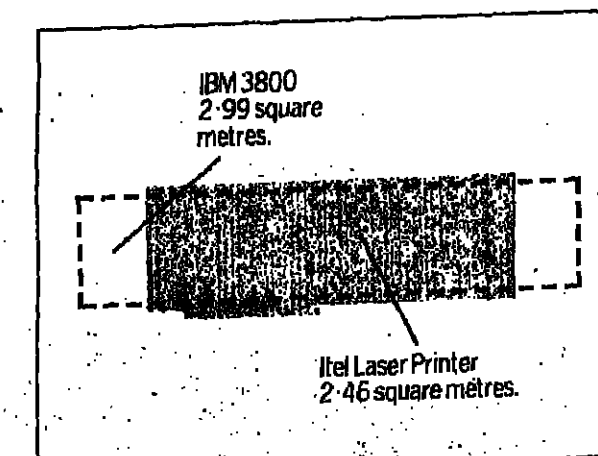
Itel's new 325 lines-per-second Laser Printer prints the facts:



The ITEL Laser Printer brings you 30% net operational advantages over the IBM 3800 - with which it is software compatible.



The ITEL Laser Printer prints on continuous form paper (with the same form flexibility as an impact printer) at a speed of 325 lines-per-second. That's 10 times faster than a typical impact printer. Yet the print quality is better.



The ITEL Laser Printer occupies 20% less floor-space than the IBM 3800 and is considerably lighter.

Talk to ITEL about their remarkable new Laser Printer. You'll find the figures very impressive. In fact, nothing can beat the ITEL Laser Printer for price and performance. Ring David Addison, ITEL (UK) Ltd. Tel: 01-741 1482 or Martin Ginger, ITEL International (Europe) Corporation, Tel: 01-584 5050.

ITEL INTERNATIONAL

Detector with a difference

—exclusive constructional design
Our metal detector really is different. The use of phase changes and digital electronics instead of conventional techniques not only makes the detector very sensitive; it allows the user to distinguish between ferrous and non-ferrous metal objects (e.g., iron and silver) in a very positive way, using light instead of sound for indication. Construction information includes a p.c.b. layout. The Paperless Revolution - part 1. We are using electronics more and more to store, process, transmit and display information. Will this new technology take over from paper completely? In the first of a two-part series, information scientist Anthony Cawkill looks at the latest developments that could affect our lives at work and at home. Valves versus Transistors. Do valve audio amplifiers give better quality sound than transistor amplifiers?

wireless world

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July Out now 40p

Edited by Martin Banks



Gaye Preston (above) of the Interdata division of Perkin-Elmer (she is secretary to UK general manager Bob Jefferson) puts her back into throwing the frisbee, and Geoff Clark (left) of Lambeth Borough Council puts on a final sprint to win the No 1 seeds heat of the men's contest.

Biggest turnout from S of Thames

THE brilliant sun which shone throughout the day for the South of the Thames heat of Computastars made a very pleasant day out for spectators, but a tiring one for competitors, particularly the finalists.

With the largest turnout of teams so far — 28 men's and 12 women's teams — competitors were on the field much longer. To compensate for this, some events were slightly curtailed, but the final results were still not announced before 7.30 pm.

Even so, the Croydon Sports Arena was the scene of some extremely varied activity throughout the day, including cricket ball and frisbee throwing, hockey-ball hitting, drop kicking, goal scoring, sack races and press-ups. In addition to the track events.

One sad omission was the hoped-for international element. Scandinavian Airlines had planned to send a team including at least some Scandinavians, but were unfortunately unable to get there in the end.

The eventual winner of the men's events was Hounslow Borough Council with 126½ points. Their team goes through to the final at Crystal Palace in September, with runners-up Commercial Union 1 and Robert Horne Computer Services, whose No 1 seed, Tony Osborn, also won the men's individual title.

Hounslow, clearly anxious to prove that their computer staff are not all brawn, also have a member of their men's team, Gary Read, in the finals of the national Othello championships. Obviously a highly talented department.

Kensington and Chelsea Borough Council, who won the Plate competition for the "best of the losers," also go through to the finals.

Hounslow Borough Council women's team, which was awarded a place in the final because the individual women's winner was a member, has been withdrawn because it did not conform to the rules of the contest. The individual women's winner is now Val Davis of Commercial Union, the third placed team that was already in the final.

The winning women's team was Rank Organisation's first team with 87 points. Perkin Elmer, pipped at the post with 86 points, deservedly join them in the finals.



Tony Osborn of Robert Horne Computer Services, winner of the men's individual title.



(Above) Eric Mayne (left) of Parker Pen and Dick Holmes of Commercial Union in the final of the men's 400 metres. (Left) A close finish in the ladies' hurdles final.

Liveware File

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PEOPLE

Top appointments at new Plessey company

COMBINING the operations of Plessey Microsystems and Plessey Peripheral Systems Inc in the US, Plessey Peripheral Systems Inc has been formed.

President of the new company is Melvin Lamph, previously general manager of Plessey Microsystems, and Gerard Mottler, formerly general manager of Plessey Europe, becomes worldwide marketing manager.

Replacing Mottler, Marcel Corninbois becomes European marketing manager. Michael Pringle becomes engineering support manager — Europe, and John Kiloby becomes administrative manager — Europe.

A North of England sales and service office has been opened in Manchester. The manager is Duncan Hilton, until recently a service engineer with PRL.

Brian Oakley has been appointed secretary of the Science Research Council, succeeding R. St J. Walker who retires on June 30. Oakley is an under secretary at the Department of Industry and has been head of Research Division since its inception in 1972.

Nick Blake, formerly marketing director of GEC Semiconductors, has become marketing manager of Ultra Electronic (Component).

Pete Polizzano, previously regional sales manager with On-Line Distributed Processing, has joined ICI as 1980 product marketing manager.

Jack Letherbarrow, marketing services manager of Adler Business Systems, has been appointed director of distributive network.

Ronald Hooker, a director of Dabulies which manufactures electronic components, has been appointed deputy chairman.

Trevor Hemmington becomes sales manager at Terminal Display Systems. Prior to this he was district manager of ADP in Birmingham.

Brian Skemish, Southern regional sales manager with Rediffon Computers, has been appointed marketing manager of Rediffon Computers International. Phil Norrish has joined Rediffon as Southern regional manager, from Burroughs where he was branch manager for Sussex.

Michael Jackson design technique, management tutorial, Marcus Bromberger, Dept of Computer Science, University of Strathclyde, Glasgow, G3 7LN. Details: Mrs Christie, 041-553 4400, ext 2132.

Multi-microprocessor systems, Institution of Electrical Engineers, IEE, Savoy Place, London WC2R 0BQ.

Social aspects of machine intelligence, Donald Michie, DCS 1978 Lecture Series, London School of Economics, London WC2R 0AE.

National security and protection exhibition and conference, International Professional Security Association, Granby Hall, Leicester.

Operations group meeting, IBM Computer Users' Association, Grand Hotel, Bristol.

Computers and lawyers, Society for Computers and Law, Pollock Hall, University of Edinburgh. Details: Mrs D. Wilson, 023-583 433.

Symposium of database teachers in UK universities, polytechnics and colleges, University of Aberdeen, Aberdeen, 92G. Details: Dr S. M. Dean, 0234 02341, ext 6031.

Dave Brooks, lately of British Olivetti where he was a business systems salesman, has joined Kodak as sales executive, terminal products for the North of England.

Brian Farley, who until recently was working as a private consultant, has joined System Aid at Southall as customer services consultant.



Diann Law outside Buckingham Palace. Diann Law is ICI's education and liaison services manager, and training correspondent for CW, before suffering a stroke in 1977, was awarded the MBE for her services to speech therapy.

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Soccer

Division I
SIA 1, Gryphon 1

Division II
ICL 1, Datsolve (City) 2

Division III
3M 5, Airfix 2
Datsolve (W.E.) 2, 3M 2

Division V
Hoskyns 2, CDC 3

Norprint divides into three

THE three divisions of Norprint will become three separate companies as of July 3, and these will form part of the Norcor Group's print and packaging division.

Chairman of the three companies will be Tony Warren, chief executive of the print and packaging division. The directors of the former divisions become managing directors of the new companies.

The industrial division becomes Norprint Ltd, managing director Peter Jordan; the retail division becomes NOR Systems Ltd at Harwich, managing director Maurice Wright; and Darley becomes Darley Business Forms Ltd at Burton-on-Trent, managing director Howard Marshall.

MICRO NEWS

NEB sums right for RAMS project

MUCH of the scepticism that has been voiced about the cost estimates being used by the National Enterprise Board in its planning for a new British semiconductor memory company is based on hard won knowledge.

In the area of accurately forecasting the costs involved in establishing a new production operation, the semiconductor industry has learned that estimates can easily be very wrong.

However, despite the quoted opinion of Jack Akerman, managing director of the Philips subsidiary, Mullard, the NEB investment of £50 million seems just about right for the start-up phase. Akerman has gone on record as saying that £500 million would be more like the figure required, quoting the fact that Philips alone has spent this much on semiconductor research and development.

With companies like Signetics in the US, RCT in France, Valvo in Germany and Mullard in the UK, Philips has a much wider area to spread its money than the new British company, certainly in its start-up phase, and informed sources have indicated that £50 million could be about right.

Such a sum would be split between establishing a wafer fabrication facility capable of producing the 64K RAMs the company will be making, estimated at between £14 million and £17 million, assembly and test equipment, and research and development. These last items are difficult to forecast. Assembly is usually carried out off-shore in cheap labour areas, but with the quoted estimate of 4,000 jobs being provided in three to four years, it must be assumed that assembly will be done in the UK.

Research and development budgets inevitably require considerable elasticity, and long-term funding in this area must be an item for consideration by the NEB and the group of engineers behind the company. Given the £50 million total budget, it seems certain that much of the initial R&D will already have been done.

From this it follows that much of the production equipment necessary to manufacture the memories will be imported from the US, even though the NEB feels this is unlikely. American companies use American equipment, and research work carried out by the group in such an environment points to little of the NEB money being spent with UK or European suppliers.

There are five major "ifs" mitigating against the new company, which must be overcome almost simultaneously if it is to be successful.

Firstly, can they find the right factory? Vibration will be a problem with production processes required to resolve 1 micron lines with accuracies approaching 1 millionth of an inch. Secondly, can the factory be commissioned quickly, which involves considerable co-operation by equipment suppliers? The third concerns getting the design right first time as there will be little opportunity to start all over again. The fourth "if" is that the process must run correctly almost from day one. This may well prove the hardest, and probably the most expensive task.

Lastly, will the company be given enough freedom by the NEB to act quickly in response to the inevitable problems it will face? Although public money is heavily involved, this will probably be one company where "public accountability" could mean instant death.

As previously pointed out (CW, June 8), if all these factors can be made to come good, the company will be entering a major battlefield in world semiconductor markets. Already, Motorola and TI Semiconductors have joined Mostek, Intel, Texas Instruments and Fujitsu as declared contenders, with Hitachi, Toshiba and Nippon Electric about to join the fray.

The volume price for 64K RAMs in 1982 is already being estimated at \$20 to \$22 apiece. This means that the new company will need to get its process running well very quickly, if it is to catch a major share.

Realistic estimates of the problems this poses can be gauged from the fact that initial production yields — the percentage of useable devices from the total processed — can be expected to be under 4%. With perhaps only 10 wafers processed per hour, at least until the process is running smoothly, and with only one shift per day — production staff will need to be trained — the initial cost per good chip could be over £100. That is, unless the NEB defers a pay-back on the investment or writes it off.

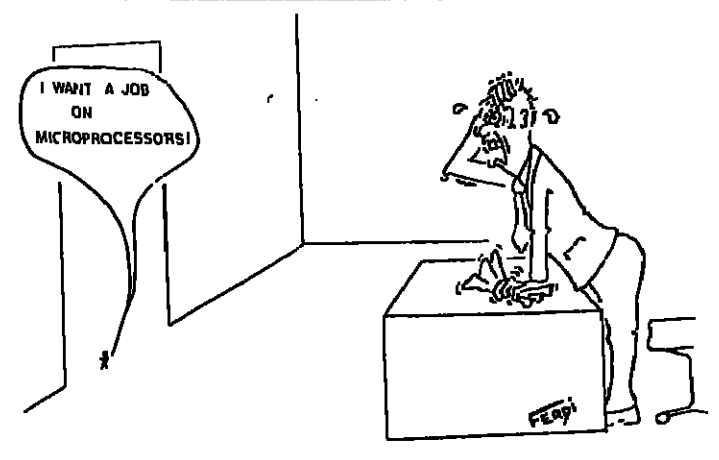
IBM 'scratching surface' on micro applications

OFF-LOADING functions from the main CPU is one of the prime areas that IBM is investigating in its growing use and application of microprocessors, and the company is only just scratching the surface.

It was stated recently by Mike Davis, speaking at a meeting of the IBCS Micro-processor Specialist Group.

The company is already using microprocessors in its Series 1 minicomputer for its I/O attachment cards, and is finding that it can get a lot of mileage from the application. Not only do they allow the terminal connection to the I/O cards to act as remote terminals when required without recourse to CPU intervention — but they are also being employed to reduce programme in the maintenance and diagnosis of faults in the system.

He also said that the company saw considerable advantages in reducing the workload for user programmers in organising terminal communications. "If you split VTAM up with micros, it's amazing how flexible you can be," he said, "and you don't need 5M bytes to hold it."



Nippon bit slice and CCD

THE Japanese company Nippon Electric is spreading itself more into the high technology semiconductor market with the announcement of a 60 nanosecond, 4-bit slice microcomputer, and a second source agreement with Texas Instruments for its TMS3064, 64Kbit CCD memory.

The bit slice, known as the µCOM 2800 series, is said to be fully compatible with the AMD 2800 market leader, and samples should be available at around 5,000 yen (£10) next month.

The agreement with Texas Instruments follows other second source deals in the CCD market, with National Semiconductor sourcing Intel, and Motorola sourcing Fairchild. Nippon is currently developing the Texas part, and hopes to have samples available by late autumn.

Two more user groups

TWO new user groups, one for Cromemco and the other for North Star, could be launched this week at the DIY Computer Show at London's West Centre Hotel, following meetings being planned by the companies' UK agents, Comart.

The hotel's Twickenham Room will be taken over tomorrow evening (Friday) when Cromemco users interested in forming a user group can meet at 7 pm, followed at 8 pm by North Star users.

Call for papers

THE organisers of the Third Workshop on Microprocessor Applications, to be held at Liverpool University from September 4-5, are seeking new papers suitable for presentation at the event.

Likely subjects for inclusion will cover selection trade-offs, software design, testing, and a wide range of applications areas. Submissions should be made to M. J. Taylor, Microprocessor Workshop, Computer Laboratory, University of Liverpool, PO Box 147, Liverpool.

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Can BCS Group fulfil its potential?

THE academic image of the British Computer Society is thwarting the operations specialist group in its attempts to attract new members and so fulfil its potential.

Can the group overcome this barrier and develop into a body which will establish an accepted code of practice for operations, and provide a service of practical use to its members?

The answer is "yes", according to Barrie Patman, who is chairman of the group and a senior training consultant with BOC Data.

He is the first to admit that, since its inception three years ago, the group has hardly set the operations world alight, but he feels that it has an important role to play provided it develops along the right lines.

Dispelling the misguided view that the group is intended solely for the likes of shift leaders and operations managers Patman emphasises that "We want to recruit operations staff from all levels in order to fulfil our two main aims — to represent operations as a whole, and to upgrade the status accorded to operations by other sectors of the industry."

According to Patman, the group is concerned about such matters as the lack of job definition, and the fact that the term "operations" has a very different meaning from one installation to the next.

"At one site the operations department takes in the data control, job control and technical support functions, while at others it is concerned solely with the operation of the system."

He adds that much depends on the philosophy of the company involved, and splits installations up into three broad categories. Firstly, there are the installations where the importance of operations is fully recognised, and where the department is allowed to use the skill, and develop the potential, that exists within its ranks.

Secondly, the exact opposite: at these sites, the programmers are held in high esteem, and the operators are considered to be just button-pushers.

In the third category, which is nothing like the other two, the installation has drifted into the situation in which it finds itself.

"It is from the third category that we would hope to recruit members initially," says Patman, "for they are the ones which would benefit most quickly from being involved in the group."

"At these sites the management are perfectly willing to let the operations department develop to its full potential, but neither the operators nor the management are aware of what can be achieved."

Of the group's meetings, which are held about every six weeks, Patman says that they provide an opportunity for operations people to meet and discuss issues of common interest.

I suggested to Patman that since operations staff are often practical in their outlook, the idea of attending meetings to discuss matters is unlikely to interest them to any great extent.

He replied, "The meetings are of practical value, because members have the opportunity to 'pick each other's brains' and so save themselves the time and effort of searching for solutions to problems which others have met and overcome in the past."

But surely there are enough user groups in existence to carry out this function? I asked. Patman pointed out that the group is concerned not only with matters of a technical nature, but also those such as the recruitment of staff and the planning of shift patterns. He added that operations managers are often faced by problems in these areas and that it is often helpful to discuss them with other managers.

What has the group to offer operators, senior operators and those who are relatively new to the industry?

According to Patman, "It will enable them to put their views across and work towards creating a better situation for themselves. For new recruits to the industry it provides a means of finding out what is available to them in such areas as career progression."

He intimated that some of the established unions do not fully appreciate the problems faced by operations staff, and that it is up to operators themselves to see that standards are raised.

Discussing the difficulties faced by the group, he said, "While there is a great deal of potential in the group, it has yet to be fully tapped. Unfortunately, the members are sometimes reluctant to commit themselves to positions which will take up a lot of their time."

"But," he continued, "the greatest problem has been letting people know that we are here and that they do not have

to be members of the BCS in order to take part in our activities."

In his view, "It is time for the group to gain credibility by being seen to be doing something which is of practical use to people in operations."

In this context, it is currently compiling a "skills register," in which the combined experience of its members will be recorded. This will be circulated throughout the group to serve as a guide to those seeking advice on problems related to their work.

This is a strategy adopted by many user groups in order to "pool" experience. If a person is faced with a particular problem he is able to consult the register and contact someone who will be able to help him.

The operations specialist group has a further use for the register, as Patman explained: "Once this has been completed it will provide us with a guide as to the various needs of the group's members. We can then go ahead and produce papers on subjects which will be of practical use."

As an aid, the group is to use Standards in Operations, published by the National Computing Centre.

Said Patman: "We will set up working parties in order to carry out in-depth studies into many



Patman... "It is time for the group to gain credibility by doing something of practical use to people in operations."

of the areas which are already outlined in the publication. We will probably also be in touch with the NCC to get their views."

Throughout the interview Patman was keen to stress the practical value of the group, but in no way does he discount the importance of its academic side.

He advocates that operations staff take at least Part 1 of the BCS entrance examination, for, as he says, "Part 1 of the examination has an operations option, and the last paper I saw had questions relating to planning shift patterns and the role of the operations manager."

He believes that by taking the whole examination operations staff will gain a much broader knowledge of the industry, which must be highly beneficial to them.

CDC launches Series 1 peripherals as the Certainty range

THE range of peripherals for IBM Series 1 minicomputers, expected for some time from Control Data (CW, February 23), has now been formally launched as the Certainty Series. It includes removable disc stores, fixed disc drives, a flexible disc system, matrix and band printers and an operator console display station.

The Certainty 270 line of removable disc stores provides 63, 126 or 240 Megabytes per cabinet and comes with a controller that occupies one input/output slot in the Series 1 processor.

The Certainty 230 fixed disc drive series has two models, the 10 and 20, that provide 9.3 and 18.7 Megabytes of moving head storage, respectively, while another two models, the 10F and 20F, each add 0.74 Megabytes of fixed head storage to these capacities.

A Certainty 230 drive can be loaded with the Certainty 210 flexible disc store which has a capacity of 608,208 bytes. Combined with the 230 drives, the 210 forms the Certainty 240 series of disc storage systems.

The Certainty 450 series of band printers uses a horizontal band with 384 characters on it to print at speeds of 360 or 720 lines per minute. A compressed pitch feature enables printing at 15 characters per inch instead of 10. The Certainty 420 matrix printer can print bi-directionally at 180 cps and provides compressed printing at 16.5 characters per inch.

The operator console display station, called the Certainty 610, has a mode and command structure similar to the IBM 4970 display.

NEWS IN BRIEF

First from Montpellier

THE first French-built IBM 3032 and 3031 mainframes have been shipped from the company's plant at Montpellier, west of Marseille. The first 3032 went to Shell in Holland and the first 3031 to the Banque de Paris et des Pays Bas in Paris.

Yves Pouppon, production manager at the plant, noted that the deliveries met the schedule announced when the products were launched last autumn (CW, October 13).

Revolution

FOLLOWING its widely reported meeting on the impact of the microprocessor, the Institute of Mechanical Engineers is to hold a further conference on the "Computer Revolution," on October 18 and 19, at its London headquarters, 1 Birdcage Walk, Westminster, SW1.

Atomic contract

A CONTRACT to maintain 600 teleprinter terminals at the Atomic Energy Research Establishment at Harwell in Oxfordshire, and at the Culham, Rutherford and AEA Laboratories has been awarded to Koda Services of Caine, Wiltshire.

Computer art dates

DATES and venues for the last of the exhibition of Harold Cohen's computer-produced art (CW, June 8) have been announced by the Arts Council. They are: until June 23, Polytechnic of Central London; August 19 to September 10, South Hill Park Arts Centre, Bracknell; September 25 to October 13, Blackpool College of Art and Technology; October 30 to November 17, University of Hull; February 19 to March 9, 1979, Birmingham Polytechnic; May 5 to 27, Abbotsholme School, Uttoxeter, Staffs.

Water Authority

goes to Honeywell

A HONEYWELL Level 60/10 is to be installed by the Northumbrian Water Authority next February, replacing an ICL 1902T system. Honeywell was one of four companies that tendered for the contract, the other three being ICL, IBM and Burroughs, although Burroughs dropped out quite early. The Level 60 system will cost about £1.5 million spread over a five-year period.

Bottled up

ROTHERHAM-BASED bottle maker, Beaton Clark, has bought a £250,000 NCR Criterion N-8450 system, which will be used principally to support the company's stock control and financial applications.

HINT OF THE WEEK

Place printers offline to avoid confusion

"VERY simple and fail-safe" is how Barry Denyer, a senior systems operator with Barclays Bank in Worthing, describes a hint relating to using printers in a direct mode in the IBM OS/VS environment.

According to Denyer, the devices should be placed in an offline state as soon as they have finished printing.

He says, "We sometimes attach both our 3211 printers to one system and use them in direct mode. To avoid confusion, we enter a vary offline command as soon as the system request for the forms control buffer has been satisfied."

At the end of each job step, the printer is de-allocated by the system and the VARY command takes effect.

If the job requires the printer in a subsequent step, the system issues a device allocation message, with an asterisk displayed besides the address of the printer previously used.

The operator responds to the message by entering the address of the printer and it is again allocated to the job.

Smartie will be ready for anything in the North Sea



MICRO CONTROLS MOVEMENTS

TO meet the need for unmanned inspection equipment to operate in the poor visibility and hostile conditions of the North Sea, Marine Unit Technology has produced Smartie. The name means Submarine Automatic Remote Television Inspection Equipment.

The prototype is based on a Motorola 6800 microprocessor with 1K byte of ROM and 128 bytes of RAM. Production versions will use the 6809 chip.

The micro is set up on board Smartie and controls all movements in response to commands from the console on board the mother ship. The console has a display screen. This shows the view from Smartie, which carries a low-light silicon intensified target camera and a Vidicon camera.

Driven by an electrical pump, the vehicle is supplied with power and control signals via its umbilical cord which also carries video signals back to the operator on the surface.

LEASING AND SECOND USERS

MOST third party lessors, as well as used computer vendors, have always favoured IBM machines for a whole list of reasons, including their abundance, the maintenance that IBM seldom refuses to provide, and the fact that the value of an IBM machine over a period of four or five years has always been fairly easy to estimate.

However, the rapidly falling cost of computer hardware, underlined by IBM's

announcements over the last two years of machines offering a lot more memory for less money, means that the residual value of a machine in the future can no longer be predicted with much confidence.

But far from depressing the third party leasing business, the new IBM machines have given it a boost, mainly because the rental charges on this equipment have not been changed as favourably as have the

purchase prices. IBM policy nowadays is to maximise its revenues and profits by encouraging sales.

So a third party lessor can now afford to buy a machine from IBM and lease it at rates that compare well with IBM's rental charges.

In this special section on Leasing and Second Users a leading IBM customer comments on why many users are reluctant

to lease and why others take the plunge, and in another article, the crucial problem of selecting the right sort of insurance cover for a leased or second user machine is discussed.

In this opening article, Parry Mitchell, of United Leasing, outlines the history of the third party computer leasing business and gives his reasons why the future does not look too bad.

Choosing the right time for investment

By Parry Mitchell

TO BE successful in computer leasing, it is necessary to choose carefully the timing of investment. In the 360 era computer leasing companies ought to have made their major investments in 1967/68. Some did, but many continued into 1969/70 writing short period leases on equipment which was about to be superseded by the 370.

I agree wholeheartedly with those who say that 370 lessors have learned very few lessons from the 360 experience.

I was a director and general manager of Standard Chartered Leasing between 1972 and 1976, and our policy during my stewardship was only to write leases incorporating a risk during the first year or two of 370 deliveries. Thereafter, with relatively few exceptions, the risk which we took on the equipment was minimal. It was a policy which was difficult to maintain, particularly if one has salesmen out in the field trying to tie up apparently juicy transactions. But we stood fast and together what I believe was one of the best leasing portfolios in Europe.

I hold no unique position in making good decisions in computer leasing. In Europe, Leasco and Citicorp also followed a similar policy in that their leasing portfolios were put to bed during 1973/74. All of these portfolios will turn out to be exceptionally profitable for their investors.

Many leasing companies, however, have, during the last two years, written leases which incorporate high residual values on 370 processors. I think that any risk taken on equipment leases written after 1975 represents questionable judgment by those lessors, and I stand firm whether or not those lessors are protected by the safety net of the Lloyd's "J" policy.

I am also fearful for those lessors, on both sides of the Atlantic, which may have offered their customers unlimited flexibility to upgrade their equipment during the firm term of the lease.

The Lloyd's "J" Policy was to leave investors in 370 risk leasing against the equipment becoming obsolete. In effect, Lloyd's was saying to the

insured that if they were in the business of leasing IBM computers, and if they conducted their business prudently and took conservative decisions on the residual values of equipment, and if when the equipment was returned after the primary period, the insured used due diligence in the marketing of machines, and then if after complying with these requirements, the unforeseen were to occur and the 370 equipment was worthless, then and only then, would the investor be paid out.

Lloyd's has been in business for over 300 years. It has been very successful and has dealt with all manner of trading. An institution which has constantly made money out of shipping will not have the wool pulled over its eyes, and we can be certain that it is well protected against any impudence from the parties it has insured.

Institutions such as many of the larger banks in the US, which have used the Lloyd's policy wisely, will probably never have to claim under it and the policy will have served its purpose. Unfortunately, there have been many leasing companies which have had the facility to use the policy and have built into their calculations residual values on 370 equip-

ment which are patently ludicrous.

Who will suffer in the end is open to dispute. It is true that lessors, which have signed seven-year leases with a facility to terminate after three years, but subject to the provisions of the Lloyd's policy, may find themselves in trouble. Much more likely, however, is that the banks which have supplied the investment funding for the leases will find themselves obliged to offer their customers the implicit break facility in the contract, and that it will be the banks themselves, protecting their good names, which will be totally exposed.

Fortunately for all parties concerned, the 370 computer happens to be very marketable equipment. I believe that despite the imprudence of the decisions, the equipment will endure and all the parties who have invested in 370 leasing will get their investment back, plus profit. Some of them, however, may have a few sleepless nights wondering how to market returned equipment located in warehouses at strategic airports throughout the world.

The 360 experience was interesting. In 1971/72 IBM started delivering its 370 systems and the bottom fell out of the 360 market. Machines were

stacked up in warehouses without the slightest possibility at that time of being placed, except at very low rates. It is true that many of the companies in the computer leasing business went through cataclysmic times. Some went bankrupt, others were taken over, almost all of them had to take massive write-offs in the value of their equipment. There were exceptions like Greyhound Computer in the US, claimed to be the largest investor in 360 equipment, which has never taken any depreciation write-offs and has continuously made profits on its 360 equipment.

In 1973/74, the recession in the US caused many computer users to look again at 360 machines and this led to a firming up in the value of this equipment. It is a process which has continued and the value of 360 machines ever since has declined on an arithmetic rather than a geometric basis.

If you look at the state of those 360 portfolios today you will see a very changed position. Boothe Computer, my old employer, is doing very well. Its 360 portfolio is written down to almost zero and is generating healthy revenues and profits. Leasco reversed its activities into an insurance company and the total operation, including its



Parry Mitchell is managing director of United Leasing.

computer leasing division, continues to generate good profits. DPF, one of the companies that was most severely affected and was close to bankruptcy, is now riding high and is a major contender in the leasing of the IBM

303X Series.

My contention on the 360 Series is quite clear. The initial investors were a little rash and a little optimistic but their marketing was good. They successfully overcame a major trough in the market, to the state where today they are now highly profitable. There was a blood bath but the army has been re-supplied and re-equipped and is now winning new battles.

So the question which now remains is, will the 370 leasing companies go through the same process? The answer as always is, both yes and no. The major investor in the 370 Series was Decimus, a subsidiary of the Bank of America. It invested in a very strong portfolio of equipment centred around the 370/158. The total value of this portfolio was probably around \$750 million. I am not privy to the structure of this portfolio nor to the length of leases, but I know the people who run the company and I am certain that it will remain profitable.

The other major leasing companies include General Electric Credit, Iteal and others. Once again their strength of management, combined with diversification policies, will ensure that their operations are successful.

How your bank can help

LAST year more than £675 million worth of new equipment purchased for British industry was financed by members of the Equipment Leasing Association through leasing contracts. This compares with the figure of £285 million for 1973.

Assets currently on lease exceed £2,378 million and it is estimated that the annual value of new leases represents more than seven per cent of the total capital investment undertaken in the UK in any one year.

Not head going for an industry which only started in the UK in earnest in the early 1960s. Prior to that leasing had been confined to such specialist equip-

ment as shoe-making machinery, copying equipment and telephone installations.

But a growing need to replace obsolete capital equipment and various periods of credit restrictions in the early sixties forced firms to look for alternative means of obtaining the use of new plant. Leasing developed as an attractive and flexible alternative.

Leasing is by no means a new concept. It was common, we are told, in the advanced culture of the Middle East 5,000 years ago. Babylonia was well used to ship leasing in 2,000 BC and early leasing in Greek culture saw leasing of slaves, mines and a factory

making ahleids. The application of leasing in modern industrial civilisation has been rather less exotic but no less important. It really originated about a hundred years ago when the Bell Telephone Company and the American

Telephone and Telegraph decided to lease, rather than sell, their equipment.

This was regarded as a sales aid to equipment manufacturers as well as a form of patent protection and continued to be the most common until the 1960s.

It was then that some of the merchant banks and finance houses entered the equipment leasing field and marketed it as an additional financial service.

The basic concept behind leasing is that it enables the lessee to acquire the use of capital equipment by making payments out of revenue. It separates use of the equipment from ownership, which distinguishes it from contracts such as a mortgage or a hire-purchase agreement, where the user either has ownership from the start, or has the option to acquire it.

Cost of assets purchased for lease by ELA members - £m

1973	1974	1975	1976	1977
288	321	340	421	675
761	1,078	1,426	1,669	2,378

Cost of leased assets owned by ELA members - £m

Figure 1

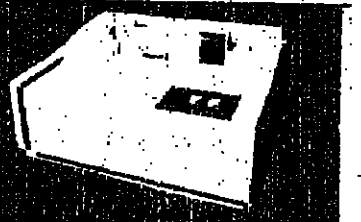
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How can the user get maximum benefits?

By Des Lee

It was 10 years before I finally succumbed to the sirens of the leasing company. In the good old days when the leasing companies were named after racing animals and gin, all they needed was a friendly bank and a secondhand IBM salesman and suddenly they were in business. Sadly some went to the wall in financing deals of over-ample

proportions where others survived to evolve into the full-blown professional outfits that are evident today. Some major questions remain in the mind of the user like, "if leasing is so attractive why isn't it more popular?" "Where does the leasing end and leasing begin?" "Can the user benefit from either, and if so, how?" "What

about flexibility?" "How will my supplier react?" "What is the true cost?" By definition leasing can be compared to the "oldest profession in the world." You own it, because the main difference between leasing and other finance is in the simple fact that invariably you will never get to

own the item of equipment of your dreams. Of course there are exceptions but these are rare. Let us briefly examine the effect that leasing has had on the market. Because of the action of leasing companies, any new IBM mainframe announcement is bound to be a sell-out simply because every user is going to order just to grab a

place in the queue. The impact of the leasing orders had been so great that IBM now has to run a raffle to decide shipment order to users. The result of this is that a user may put in a "day one" order (in some cases day minus one) without regard to financing or benchmark performance in the hope that he or she will be granted a position in the queue. Because of this, speculation is rife over what shape future announcements will take and, more important, when the announcement will be made.

The blame, if that is the right word, for this situation must be laid at the door of the leasing companies because they can order two machines per month for unspecified delivery where you and I may be asking for one in 12 months' time. IBM quite rightly demands a financial guarantee to ensure that their orders are not speculative but if a leasing firm's parent company happens to be a bank then it is not too difficult for it to get a guarantee, especially knowing that it is acquiring something which is bound to be highly marketable.

Thus, when the raffle takes place your one chance ranks against the leasing company's 24. There are no prizes for guessing the winner. Perhaps, if leasing companies had to identify the final destinations of their machines at the time of order, like other users, then the latter might stand a better chance in the ballot for machines.

The other major impact that the leasing companies have on the market is to prolong the life of elderly computers, and many 360 systems are still in harness thanks to their efforts. By prolonging the active life of the 360 and the early 370 systems by purchasing them when they are due for replacement and thus maintaining a high resale value, leasing companies make purchasing a machine that much more attractive for those that can afford to do so.

What are the advantages of leasing to the user? These vary with the leasing company and the type of equipment. Naturally, it pays to shop around. By leasing you gain financial benefits, cheaper rental and no depreciation in the case of an IBM machine. Your company's financial investment in an expensive computer can be unshackled to provide funds for other needs. You can protect against periodic price rises in rental. You can probably increase your processing capacity for the same money. In certain circumstances, you can even change equipment in mid-lease without penalties.

So what do you lose if you sign up for three, five or seven years? Flexibility, mainly. Because of the problems of getting a place in the queue if you are signed up for a longer period you may be caught out by the next IBM change. But, after all, we are supposed to be DP professionals with three-year minds and



DES LEE has been actively associated with the computer industry since 1962, when he worked with the National Coal Board at an installation. After a short spell at Centre-file he joined Rowntree Mackintosh in York where his responsibilities include evaluating the RM Group's future computing needs. He is also chairman of IBM Computer Users' Association and is well known for his forthright views on the lot of the computer user.

Here, the author examines the leasing business from the user's point of view and answers some of the major questions which are likely to remain in the mind of the user.

therefore, it doesn't really matter if we don't have the latest and greatest machine sitting in our computer room because when we supposedly evaluate a machine we ensure that it is capable of performing our future known schedule, plus a little extra capacity for good luck!

Our deliberations apply equally to hardware and software and if our chosen computer was good enough before an announcement, why not two or three years afterwards? The major disadvantage is the fact that in this day and age, due to technological advancement, the majority of computer hardware announcements claim to give twice as much for half the price. It is the fear of this that inhibits the user's acceptance of leasing.

For example, if you enter a lease at 85% of current rental and quickly need more capacity, and an announcement is made doubling performance for the same money, then your investment could turn out to be sour. The other fear, that of revolutionary software changes, died with the 370/155. All future announcements will be evolutionary rather than revolutionary.

Will the computer manufacturers ever put a stop to the activities of the leasing companies? I don't think they will do so intentionally because we have already established that the leasing companies have a useful role to play in today's market. However, neither will they go out of their way to protect them. One quick-fire announcement from IBM following hot on the heels of another with significant price advantages would cause severe embarrassment to leasing companies as they would be caught with expensive machines on their books and no customers. And it is likely that a few customers could be caught in the net as well, and that would be disastrous.

Who then are the ideal leasing customers? I don't think you can typify any of them because all of us who do lease do so for a variety of reasons. However, leasing naturally favours those who require cheap workmanlike computing like the service bureaux, or those who require a second machine for back-up.

What, therefore as users, can we deduce? Leasing can be beneficial if you are prepared to risk the consequence of guessing those with growing workloads and static applications. It can also provide cost effective upgrades in light financial situations or a cheaper solution to a back-up problem.

Will we witness the demise of leasing? Not necessarily because there is no advantage for a computer manufacturer to make this happen. It is likely that changes will occur and profit margins will get slimmer but there will always be a market for a good secondhand computer on an attractive lease for those who want it.

Tip-toeing through insurance minefield

By Alwyn Farey-Jones

IBM's insurance clause in its rental agreements is a model of an insurance policy. It is only one sentence long and indemnifies its customers against all risks of physical loss or damage to the machinery, other than caused by nuclear reaction.

When you purchase or lease you have to organise the insurance yourself. This needs careful thought by both data processing and insurance management.

Unfortunately, most insurance policies are not as simple as the IBM clause. They often contain exceptions. You have the responsibility of setting a value to the equipment yourself, and your contract with the insurers will be set in a legal background which many would regard as being heavily weighted in favour of the insurer.

It is most important to relate the insurance contract to the maintenance contract and other contracts with IBM. Don't forget you will have two parties to deal with, not just IBM. You must consider the possibility that IBM will say "that is an insurance claim" and the insurer will say "that should be fixed under the maintenance agreement."

IBM's contract says that you must have a stable power supply, so it is important that the insurance contract doesn't exclude "electrical disturbance." Nearly all policies will exclude damage due to withdrawal of power supply by industrial action if warning is given, but many exclude even unexpected withdrawal of power. Sudden power surges or damage caused by out of sequence power down are a substantial cause of computer damage.

Beware of any exclusion for derangement. Although the manufacturer will mend a machine that goes wrong, a derangement exclusion opens the way for argument between the

manufacturer, the customer and the insurer.

So does an exclusion for defective design or manufacture. I know of one major bank which spent 15 months pursuing unsuccessfully a claim against its insurers for damage to ferrite rings in a 380/65 memory. The insurers rejected the claim on the grounds that it was either a derangement or the design was defective. Under insurance law, the onus is on the insured to prove his loss, not on the insurer to show grounds for the rejection of the claim. In the end the bank swallowed the cost of the new memory plane itself.

Other exclusions to be careful of are for negligence, especially if there is a derangement exclusion as well, short-circuits and inductive effects.

What sum assured should you set for your equipment?

Will your insurance policy re-instate as new? If so the sum insured should probably be the new list price. Perhaps you are happy to receive a second user replacement? Indeed, for availability reasons, you may need to accept a second user replacement machine anyway. If so, perhaps the second user price may be the correct sum to insure, but not necessarily.

Take care that you and your insurer are of one mind. The situation for replacing a total loss is clear. However, unless you have a specific agreement the insurer may downgrade the claim paid for partial damage in the proportion that the sum insured bears to the value as new by the application of what is known in insurance jargon as average.

Average causes more ill-feeling between the insured and the insurer than any other single doctrine, so it is worth explaining it from the insurer's point of view. Let me give a simplified example.

Supposing in a certain year, an insurer insures 1,000 new computers each worth £500,000

Buying or leasing a second-hand IBM system? In this article Alwyn Farey-Jones, managing director of Computer Insurance Ltd, gives a timely warning to remember to take full account of the insurance aspect.

Unlike when an IBM system is rented with its "catch all" insurance clause, buying or leasing means that the user must arrange its own insurance. And this is where the problems start. Farey-Jones gives a guided tour through the minefield and concludes by urging all DP managers to pick brokers who know about computers.

at a rate of .15%. The total premium is £500,000 x 1,000 x .15% = £750,000.

Now suppose his loss experience for the year is typical and the cost of repair with new parts and manufacturer's labour costs are:

1 loss of £300,000 = £300,000
2 losses of £100,000 = £200,000
8 losses of £25,000 = £200,000
Total £700,000

This leaves him an underwriting profit of £50,000 for the year.

Now what happens if five years later, all his clients reduce their sums insured by half to £250,000 each to reflect the second user value and thus reduce the total premium paid to the insurer to £375,000?

There is no difference in the risk conditions themselves due to the decline in value of the computer, so let's assume the same loss experience. Let us ignore inflation and assume the equipment repairs cost the same as before.

Now if the insurer pays out the costs of repair as now in full, apart from the biggest loss which is now treated as a total loss and replaced with a second-user machine at £250,000, then the total losses for the year are only £50,000 down to £850,000.

The total premium, though, has been cut in half to £375,000, the insurer has an underwriting loss for the year of £275,000.

The standard way round this difficulty for the insurer is for his

policies to be subject to average, which means that if you pay only x% of the premium for full re-instatement you will be paid only x% of any claim.

The implication of this is that your broker should present to the insurer both the new replacement cost of the machine and the second user value and get a rate agreed that will pay partial loss claims in full, but consider any claim in excess of the second user value a total loss at that value.

If you are the user of a machine purchased or on third party lease new from IBM, you can still insure for market, ie second user value. In that case, there is an important discussion you should have with IBM — in the nice language of which IBM is a master — about whether "marketing support" would be available as for a new machine if you replace with a second user machine after an insurance loss.

If your computer is acquired on a lease it is possible that after a loss, you are still required to pay lease rentals in excess of what you would otherwise get as the insurance value of the machine. This also needs to be reflected in your insurance cover. (You have this obligation if the loss is your fault even under an IBM rental contract, is this liability reflected in your insurance cover?)

This article is about the insurance of second user machines so I will, only briefly, mention consequential loss insurance which is applicable to new or used,

purchased, leased or rented machines equally.

A message that has come through to us from our claims case study file is that the time taken to recover from a loss is generally greatly underestimated. Even if it is possible to arrange standby from another site for a modern database/data communications system at all, the sheer length of time involved can be enormous.

Computer departments are increasing their importance year

by year as the nerve centres of their enterprises. The effects of damage to a computer centre should be the subject of very special analysis by the DP department, the insurance department and line departments, perhaps with the aid of a specialist adviser.

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The present configuration is an ICL 66K 19021 with discs, tapes and VDU's. This will be upgraded to 96K with 7502 systems supporting further VDU's. Applicants should have COBOL programming experience.

We also make extensive use of the PL/I language and develop on-line systems using applications manager software. The successful applicant will play an active role in our development programme in all three of these languages. Training will be given where necessary.

Our salaries are competitive and we offer 22 days annual holiday plus 8 statutory days, and a subsidised living room in our modern offices situated in the centre of Market Harborough.

Please telephone Market Harborough 4771 or write for an application form to:
Mrs. J. M. Freer, Employment Officer,
Golden Wonder Limited,
Edinburgh House, Abbey Street, Market Harborough, Leicestershire.

Golden Wonder

UNIVERSITY OF LEICESTER SYSTEMS ANALYST/PROGRAMMER

Applications are invited from suitably qualified and experienced candidates for the above post of Systems Analyst/Programmer in the Faculty of Education.

The successful candidate will be responsible for the technical development of an integrated computer system and management information system including the design and development of the hardware, software and data base. It is expected that the successful candidate will be required to work on a full-time basis.

Applicants should be able to demonstrate a high level of competence in the use of the following languages: COBOL, PL/I, BASIC, FORTRAN, ALGOL, and PASCAL. They should also have experience in the use of the following hardware: ICL 19021, ICL 19022, ICL 19023, ICL 19024, ICL 19025, ICL 19026, ICL 19027, ICL 19028, ICL 19029, ICL 19030, ICL 19031, ICL 19032, ICL 19033, ICL 19034, ICL 19035, ICL 19036, ICL 19037, ICL 19038, ICL 19039, ICL 19040, ICL 19041, ICL 19042, ICL 19043, ICL 19044, ICL 19045, ICL 19046, ICL 19047, ICL 19048, ICL 19049, ICL 19050, ICL 19051, ICL 19052, ICL 19053, ICL 19054, ICL 19055, ICL 19056, ICL 19057, ICL 19058, ICL 19059, ICL 19060, ICL 19061, ICL 19062, ICL 19063, ICL 19064, ICL 19065, ICL 19066, ICL 19067, ICL 19068, ICL 19069, ICL 19070, ICL 19071, ICL 19072, ICL 19073, ICL 19074, ICL 19075, ICL 19076, ICL 19077, ICL 19078, ICL 19079, ICL 19080, ICL 19081, ICL 19082, ICL 19083, ICL 19084, ICL 19085, ICL 19086, ICL 19087, ICL 19088, ICL 19089, ICL 19090, ICL 19091, ICL 19092, ICL 19093, ICL 19094, ICL 19095, ICL 19096, ICL 19097, ICL 19098, ICL 19099, ICL 19100, ICL 19101, ICL 19102, ICL 19103, ICL 19104, ICL 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Bureau Sales Executive

London

A well established company is seeking a Sales Executive to manage the sales of services for a Central London Bureau.
This is a positive opportunity for a young person with a proven sales record to expand their experience and progress with a growing organisation. Candidates must have a sound background, preferably as a programmer or analyst, in commercial systems development. Ambition and enthusiasm are also essential for this position.
Excellent opportunity with career potential.

Contact: Jim Baker

RPGII Programmers

London

A small but extremely busy software house, specialising in the provision of turnkey systems to the legal and general commercial world, has vacancies for experienced RPGII programmers who either hold Senior Programmer positions or who have reached the point where they feel able to do so.
Additionally, applicants must be equal to the challenge of working on a variety of MINIs and MICROs for which training will be given where necessary, and of developing a variety of systems and applications on-site at locations throughout the London area.
Salaries are negotiable according to experience and ability.

Contact: Andy Wright

Field and Support Engineers

All areas

Several of our clients, mainly mini-computer suppliers or manufacturers, seek good experienced field and/or support Engineers. Generally, the work involves dealing with a variety of problems associated with hardware and diagnostic software. In some cases training will be provided during the early stages.
Candidates must be able to demonstrate a sound systems approach to their work and be capable of dealing with people at all levels.
The positions offer excellent remuneration packages, career prospects, and work involvement. Applicants are invited to call and discuss their requirements and aspirations.

Contact: Mike Creamer

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

Analyst/Programmer

London SE1

Continuing expansion of this successful bureau has created an urgent requirement for an extra analyst/programmer to join their small and highly skilled development team.
Applicants should have a minimum of 18 months COBOL experience on UNIVAC 1100 equipment, but most of the work involves new development on PDP 11/35's using BASIC +, for which full training will be given.
Opportunities for Project Management could come quickly to those able to learn fast and possessing the necessary drive.
Salary progression will be rapid if you can really match the demands of this job.

Contact: Andy Wright

Analyst/Programmers

Coventry

We have been retained by an international engineering group to recruit a number of Analyst/Programmers to work on the development of commercial and production systems.
Applicants must have a minimum of one years experience of COBOL, preferably on a large machine. The more senior positions would obviously require several years in an appropriate environment using systems design and database techniques.
Salaries are negotiable according to experience. Excellent fringe benefits including relocation expenses.

Contact: Jim Baker

AUSTRALIA

Computer professionals with more than 3 years experience who are determined to emigrate to Australia will benefit from our consultancy service.
Initially, we advise and provide an assessment of your career prospects in Australia and, later, when your arrival there is imminent, you receive the concentrated services of our Associate company in setting up introductions to suitable vacancy positions in Australia.
Since JBA commenced this service we have been extremely successful in arranging a selection of possibilities for people arriving there (mainly in Sydney and Melbourne) and the people concerned thereby found ideal employment very quickly.

Contact: Mike Creamer

To BSK BASIC PROGRAMMER Hants
Generous company benefits are offered by very substantial international service organisation to BASIC programmers with solid commercial experience of 2 years or more on PDP 11.

To BSK SYSTEMS ANALYSIS Kent
A promising background in programming with COBOL on ICL machines with 18 months analyst experience is the specification for the physically sound and intelligent in the associated related service industry.

To BSK SUPP/SYS ENG. Sussex
Service and advice more computer systems and provide basic maintenance to computers and equipment, also assist customers. Preferably PDP 11 or ICL data experience and OMC or C.H.G.

168 Finchley Road, London, NW3 6HP

HEPBURN & ASSOCIATES LIMITED

Computer Systems & Recruitment Consultants

IRELAND

Our client, a major food processing Group with production facilities throughout Ireland, plans to install three Digital Equipment PDP 11/34 minicomputers later this year. The computers will be located at their three main operating plants. A communications network will also be set up.

These developments have created the need for the new appointment of a

DATA PROCESSING MANAGER

who will be responsible for all aspects of computer systems, programming, operations, data entry and communications.

The person selected should have extensive experience of the use of computers and, in particular, have

- sound experience in the design and implementation of an IBM commercial systems
- a good educational background, preferably with some degree or qualification
- experience of most computers, preferably Digital Equipment PDP single using BASIC and RSK 11
- the ability to communicate with management and staff at all levels

The salary and other benefits will be commensurate with the importance which the Group places on this major computer development. The Manager will be located in the vicinity of Dublin.

Applications, which will be treated in complete confidence, should be directed to the following:

TONY HEPBURN
Hepburn & Associates Ltd.
33 Fitzwilliam Square
Dublin 2
Telephone: Dublin 681168 or
Glasgow 3344833.

XOREN

50 Ainslie Road
Manchester M18 8HW
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REAL TIME MINICOMPUTER SYSTEMS DESIGNERS & PROGRAMMERS

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Xoren is an expanding consultancy and software house specialising in real time minicomputer and microprocessor systems. Established in London in 1974 the company is currently working on projects in the U.K. and North America, and specialists in:

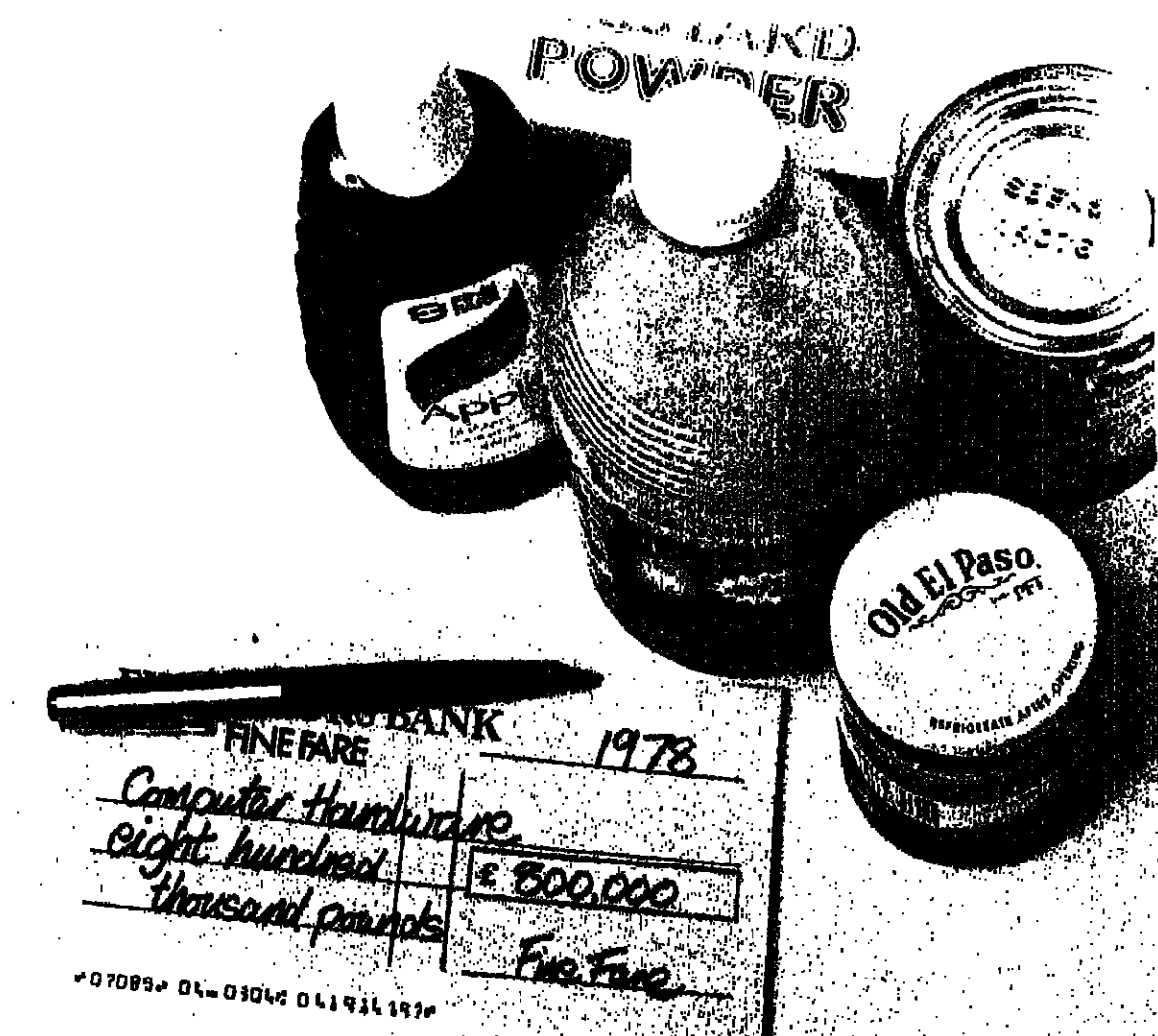
COMMUNICATIONS
PROCESS CONTROL & TELEMETRY
MULTI-PROCESSOR SYSTEMS
BASIC SOFTWARE

An office is now being opened in Manchester to serve clients in the North.

Applicants should have a good understanding of real time systems and a sound knowledge of at least one minicomputer or microprocessor. For senior posts, proven systems design capability is essential and project leadership experience would be an advantage.

A member of the
Computing
Services
Association

Please write to, or
telephone Mr. M. Griffith
giving details of ex-
perience.

**Welwyn Garden City**

Senior Analyst/Programmers (Team Leaders) £5450-£6150

Analyst/Programmers (Grade 1 to 3) £4250-£5450

Senior Programmers £4250-£4850

Most of our staff are now working on a new challenge and opportunity for today's ambition and drive with young energetic people. And nowhere is this more true than at Fine Fare.

Now, out of the country, leading retail organisations, were still expanding in all directions. Our Group operations include everything from Superstores, Non-Food Stores and ITC Centres, through conventional supermarkets to our last developing 'Shoppers Paradise' and 'Elmo' discount chains - and we're still searching out fresh trading opportunities. And we depend heavily on computer systems to support this growth.

Over the last year, for example, we've spent £300,000 on additional hardware, and we're spending £800,000 more in the year to come. We are investing in a large PDP-11 based Data Communications Network and in-store EPOS systems to supplement our new Mainframes.

Do you see a challenge and opportunity for yourself? Are you excited at the prospect of developing new batch, interactive and distributed systems? Are you looking for experience and training in COBOL, or BASIC + 2?

The opportunities right now for your development and growth with Fine Fare are tremendous, whether as a team leader or as part of a professional development team working on the implementation of specific new systems or extensions to existing systems. So if you have at least 3 years' experience in design, analysis and/or programming (any language), we're offering the above salaries, and will pay relocation expenses.

At Fine Fare we thrive on change, development and growth, and if that makes sense to you we suggest you lose no time in giving one of our people below a ring in the office or at home to set up an interview.

WE GIVE COMPUTER PEOPLE FOOD FOR THOUGHT

Weekdays up to 5.30 p.m.
Phone Welwyn Garden City (07073) 28140
Evenings from 7.30 p.m. and Weekends
Stephen Hill - Head Office Systems Manager
Sleevage (0438) 811329
Mike Bradley - Distribution Systems Manager
Hicklin (0462) 4086

Cedric Hopkins - Computer Services
Manager Cambridge (0223) 870926

If you prefer, write giving brief career details to Cedric Hopkins at Fine Fare Ltd., Gale House, Frotherie Road, Welwyn Garden City, Herts. AL8 6NB.

FINE FARE**COMPUTER OPERATOR**

£3800-£4300 Inc. Shift Allowance

Applications are invited for the above position operating an ICL 1902T 64K machine based at our Crawley computer installation.

The applicant should have a minimum of 18 months' 1900 operating experience with a sound working knowledge of George II. Salary will be within the above range according to experience. Other benefits include car purchase schemes and 4 weeks holiday.

Please apply to Maureen Cross, Toyota (GB) Ltd., 320 Purley Way, Croydon CR9 4HB. Tel. 01-681 1921.

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LEN E7	SRN SYST ANALYST	£6,500+
LON W1	JRN SYST PROG	To £6,500
LON/H COUNTIES	COBOL PROGRAMMERS	To £6,500
FELTHAM	1800 PROGRAMMERS	£6,000
LEN E7	SRN SYST ANALYST	£5,500+
FELTHAM	YME B/DMS PROG	£5,500+
LON W1	SRN APP PROGRAMMERS	To £5,500
LEIGHTON 6220	SRN SYST ANALYST	£5,300+
HOLLEY	PROGRAMMERS	To £5,300
LON RW10	TECH DOCUMENT WRITER	£5,000
BRENFORD	RPN II PROGRAMMER	£5,000
FELTHAM	ANALYST/PROGRAMMER	£4,500+
BRENFORD	SHIFT LEADER	£4,500
FARNBOROUGH	BASIC PROGRAMMERS	£4,500
SURNEY	TRAMEE PROG	£3,000

Please telephone or call in for details of these and other vacancies and an application form.

AMES PERSONNEL

Employment Agency Suite 14, Dryden Chambers
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PROGRAMMER/ANALYSTS

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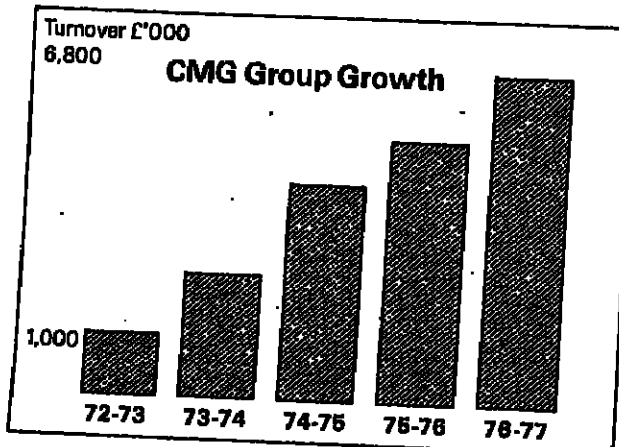
To apply for these positions please telephone Sylvia Walton or write to:

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Janet Stirling, CMG Computer Management Group (Scotland) Ltd., Highland House, 58 Waterloo Street, Glasgow G2 7DA. Tel: 041-221 8193/6.

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ANYTHING ELSE YOU WOULD LIKE TO ADD:

SIGNATURE

DATE

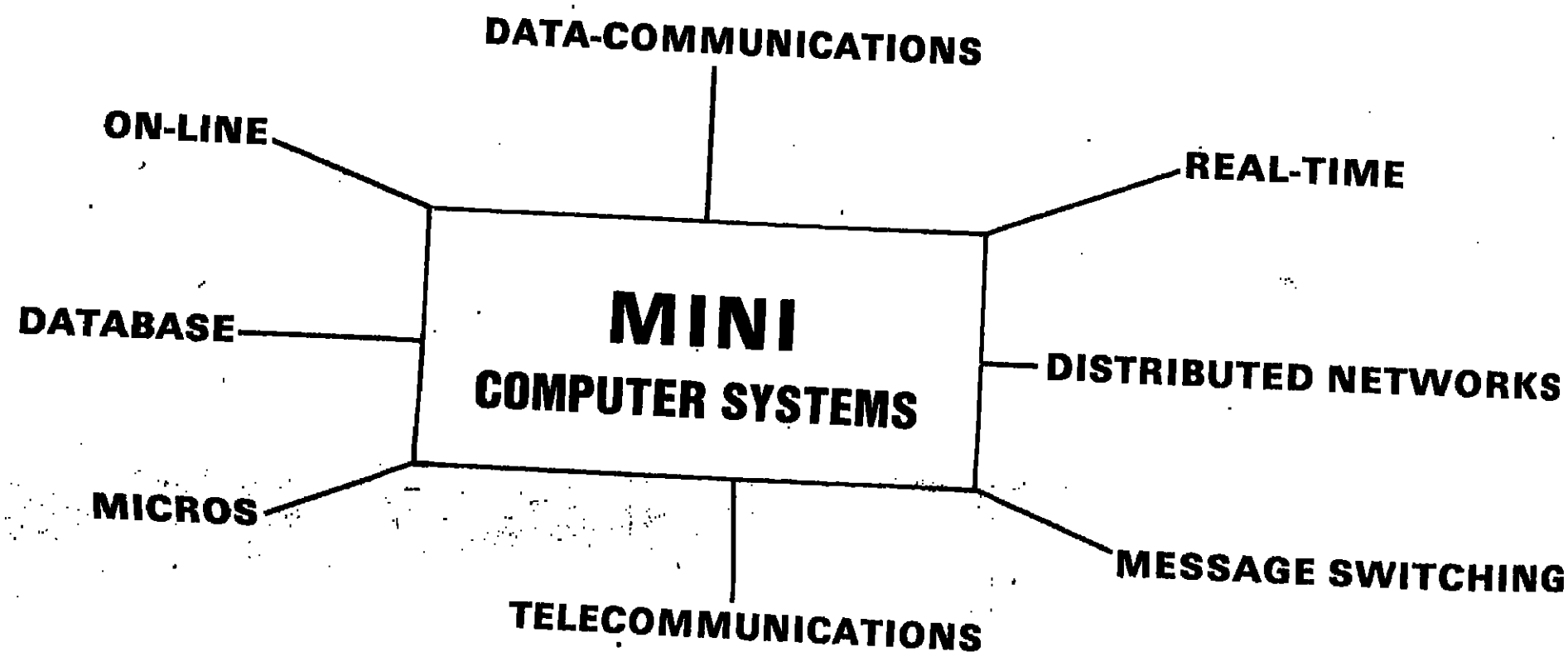
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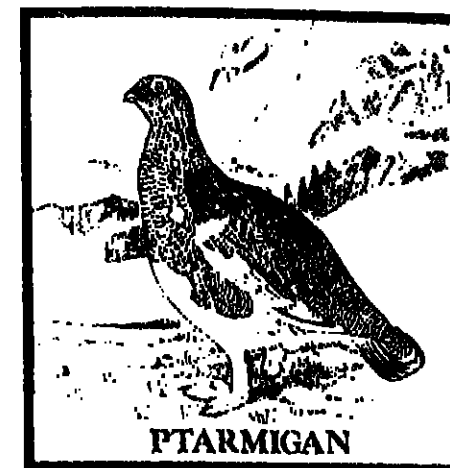
Contact us at your earliest opportunity to discuss in more detail the opportunities available to you. We shall be arranging interviews for you to meet the client in London during the next two weeks.

Bill Seymour 01-637 5001

U.K. Office, Portland House, 4 Gt. Portland St., London W1N 5AA
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Contact: MARILYN DAVIDSON



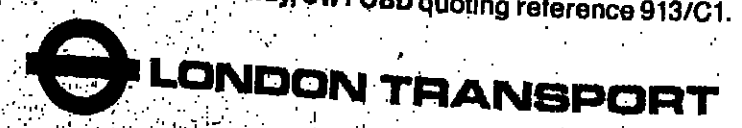
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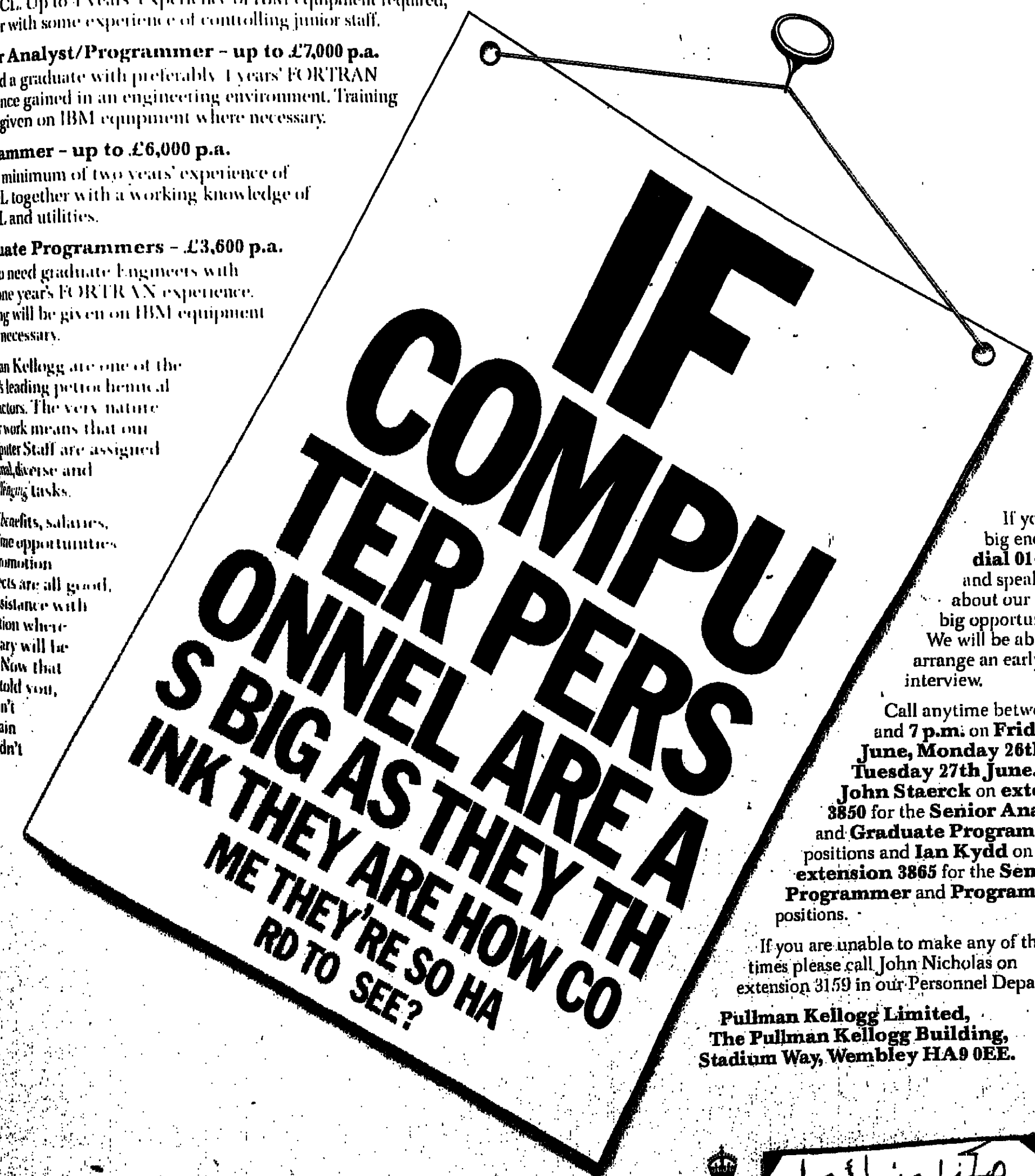
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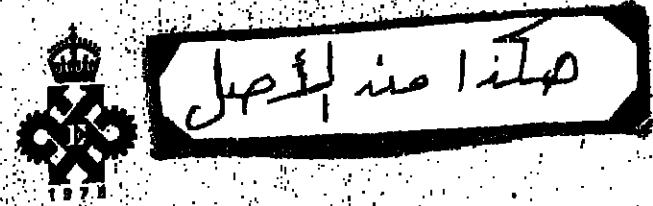
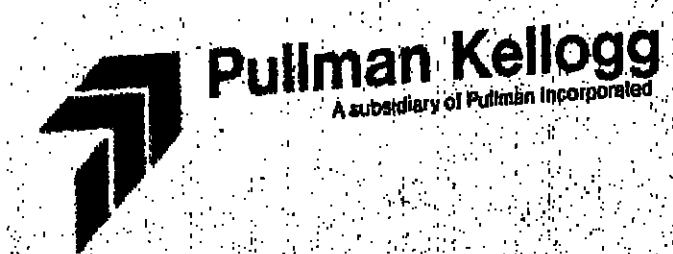


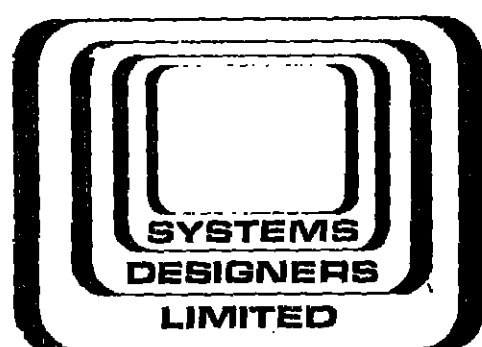
If you are big enough, dial 01-903 8484 and speak to us about our equally big opportunities. We will be able to arrange an early interview.

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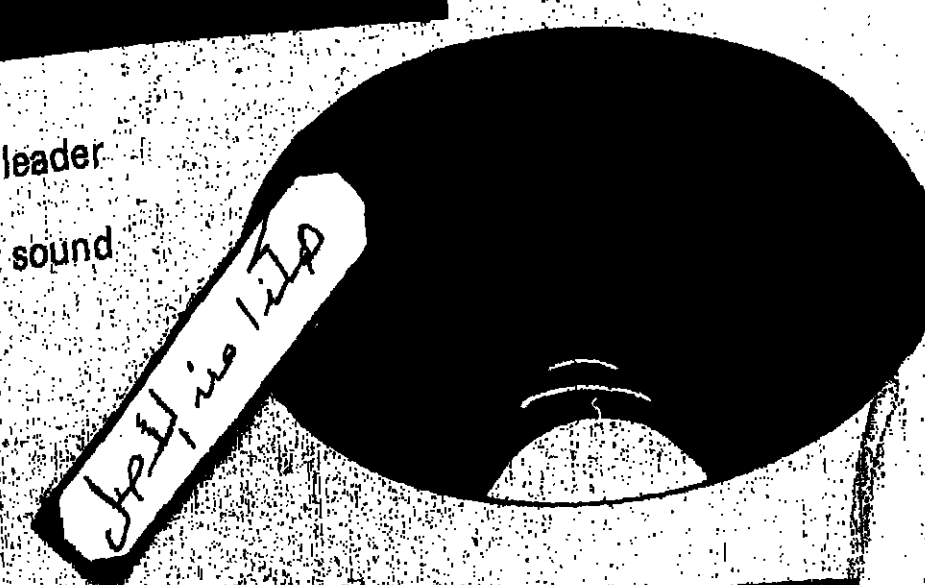
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We're looking for good people at all levels, from project leader to trainee, to work on the development of systems for the distributed processors and IBM mainframes. Doesn't that sound an interesting and... hey! Don't go! Oh, well! You can't win them all.

WHY DON'T YOU CALL US?
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Programmers & Analyst/Programmers

Our Client, a major manufacturing organisation is seeking additional staff to be actively involved in the company's present expansion plan with D.P.

You will join a project team involved in a variety of commercial systems representing a stimulating and challenging environment for people wishing to extend their applications knowledge.

Successful candidates will have at least one year's experience of either COBOL or PL/1. The Analyst/Programmers should have been involved in the implementation of at least one large commercial system.

The Company is very conscious of developing employees' skills and award them with a secure future and career progression. Apart from competitive salaries and four weeks' holiday, other attractive employee benefits are also provided.

TURNKEY SYSTEMS

SURREY

Programmers to Consultants

To £7,500

The demand for mini computer systems has accelerated so rapidly that our client requires D.P. professionals at all levels to develop and install total systems based on mini/micro equipment. Hardware procedures for the first time. Applicants seeking to progress their careers within an exciting environment should be experienced in one of the following:

- * Small Machines
- * Basic or RPG II or Assembler
- * Commercial Applications
- * Implementation Financial Systems
- * First-time User Contact
- * HND in Business Studies or similar

Situated in Surrey, the company offers pleasant and informal working conditions (flexible hours, 4 weeks holiday, etc.), coupled with genuine career prospects.

PROGRAMMERS

C. LONDON

UP TO £6,000

DEVELOP COMMUNICATIONS SYSTEMS

Joining a technically stimulating and progressive department you will program advanced systems and be encouraged to develop skills in team leading.

Initially you will join project teams implementing a variety of new commercial applications and receive full training in relevant technical issues where appropriate.

If you have good COBOL experience, gained on any machine, you will have the opportunity of playing a major role in the current unusual development programme.

Our Client offers an attractive benefit package which includes flexitime, four weeks' holiday, LVs, with rapid career progression.

SENIOR ANALYST/PROGRAMMERS

S. LONDON

To £6,000

We are seeking SENIOR PROGRAMMERS or ANALYST/PROGRAMMERS keen to enhance their career by further involvement in the analysis and design of total systems.

These positions offer the opportunity to gain experience of:

- * 3 DATABASE Systems Hierarchical, Codely, Relational
- * Team Leading Responsibility
- * Developing new Systems from Feasibility to Completion
- * Advance Project Control Concepts
- * Close User Contact
- * Full Training

Applicants with 2-3 years' COBOL experience will be offered an excellent commencing salary enhanced by Pension Scheme, 4 weeks Holiday, Staff Restaurant, Social Club and if necessary removal expenses.

24-hour answering service

Please telephone for a confidential discussion or write to:

30 Fleet Street London EC4Y 1AA
01-353 0981

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As an experienced operator, you're on the sharp end of the computing business. You know the difference between a suite of programs that will run smoothly and one that's going to create headaches.

At Sainsbury's, we could use your kind of experience. And we're ready to pay for it to the tune of around £6,000.

We're looking for a man or woman to help us get new and amended systems installed and working smoothly on our existing 1900 new dual 2870. Specifically, you'd be involved from the early stages of systems definition, and in specifying the groupings of programs into their operational jobs. Data security would also come under your sphere of activity, as would writing the job control language (George II and VME/B) and giving practical advice on systems, installation and testing.

At present, we see you as an operator plus — someone whose experience and intelligence is fast outgrowing just another ops job, and who knows George III at job description writing level.

As well as the salary we've quoted, we can offer you the chance to gain 2800 experience, plus the general experience that could be your springboard into operating management.

Lorraine Cathersides will tell you more. Phone her on 01-921 6047.

J. Sainsbury Ltd., Stamford House, Stamford Street, London, SE1 9LL.

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Operational Research Analyst

Urgently required to work a major telecommunications contract in Iran. 1-2 years' contracts in Tehran. High tax-free salary plus excellent accommodation. Must have experience of network-based scheduling systems and be familiar with data processing and scheduling software packages to support critical path and project management techniques. Degree in engineering or construction management preferred.

Advanced Personnel Services Ltd. (gov)
The White House, Lodge Road, London, NW4
Tel. 01-203 4272
or cable HEADHUNT LONDON

METROPOLITAN BOROUGH OF Rochdale

PROGRAMMER

(Computer Section)

AP.2/3 £2,983/£3,773

Treasurer's Department

The present installation comprises an ICL 64K 1902T with tapes and discs and communications equipment which will be replaced by an ICL 2880 system later this year. Substantial development of on-line systems is planned. A knowledge of 1800 Cobol is desirable. APPLICATION FORMS available by quoting Ref. No. 8.581 from the Chief Personnel Officer, 168 Drake Street, Rochdale OL16 1XG, to whom they should be returned by 3rd July 1978.

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ANALYSTS

HONEYWELL

On-line systems. Experienced Senior Commercial Analysts required. Staff purchase and pension schemes.

MIDDX.

£6500

MINI-COMPUTER ANALYSTS

Established international company seek Analysts with mini-computer experience. Company makes commercial business systems. VRC experience useful, not essential.

LONDON

£7000

PDP

Travel abroad, real time systems, project leadership, excellent salary and conditions. Experience of PDP machines essential.

LONDON

£7000 +

SENIOR SYSTEMS ANALYST

Large multi-national company require a Sen. Analyst with 10 years experience. IBM background preferred. On-line and real time systems opportunities.

MIDDX.

£7500

ICL

2 years' analysis experience with a COBOL background. On-line systems running under GEON and a knowledge of DBCS is essential.

KENT

to £7000

ICL

This is a very large and well-known company, using GEON with real time systems. Experienced Sen. Analyst required to assist in development. Pension scheme, flexi-time and life assurance.

MIDDX.

£6500

HONEYWELL

Self-motivated Analyst with good commercial experience and knowledge of on-line systems for new development. Benefits include a relocation package, pension scheme and flexi-time.

BERKSHIRE

£6000

IBM

One client is seeking an experienced Project Leader for commercial consultancy work. Experience of System 3 32 or 14 preferred. Possibility to work abroad if desired.

LONDON

£7000

SYSTEM-3

At least 2 years as Analyst or Analyst/Programmer, with sound knowledge of RPGII. Good commercial background will help gain a good position in this company.

MIDDX.

£5600

PROGRAMMERS

COBOL

A Honeywell installation offering excellent prospects for future promotion.

MIDDX.

£4½-£5½

COBOL

IBM O/S installation offering generous salaries. Excellent prospects and benefits. 9 months — 3 years' experience.

KENT

£4000-£5500

COBOL-ASSEMBLER OR PLI

Good working conditions and many commercial on-line applications. IBM O/S installation offering relocation expenses, good prospects and generous holidays.

STAFFS. £4000-£6000

NEAT-3

Working on financial and banking applications, this company can offer non-contributory pension and mortgage assistance.

LONDON

£5500

PDP

One of the largest users of PDPs in the country with many on-line, real-time systems in operation. Excellent working conditions, flexi-time and sports club. Travel abroad to implement systems. Promotion prospects.

LONDON

£5000

RPG II

An ICL 2903 installation require a programmer to lead a development project and also assist in writing specifications. Some user contact. Social club and staff canteen.

SURREY

£5600

MINI-COMPUTER EXPERIENCE

Programmers with mini computer experience, in commercial fields are required urgently. VRC experience useful. Excellent salaries with good prospects. Opportunity for new languages.

SURREY

£6000

COBOL-ASSEMBLER

Well-known company seeking an assembler programmer or somebody with COBOL experience. On-Line and Real-Time systems are in operation.

SURREY

£4800

COBOL

Urgently required for an IBM O/S installation (some analysis experience useful). Excellent working conditions with good promotion prospects. Season Ticket loans, non-contributory pension, life assurance and mortgage scheme.

LONDON

£6000

OPERATIONS

OPERATIONS SUPPORT

IBM 370/OS. JCL experience. Knowledge of PL1 programming preferred but will train. Days only.

WEST LONDON £5000

OPERATOR

1 year + IBM 370/OS experience. 3 shifts, subsidised canteen, excellent career path.

WEST LONDON £4000

2 OPERATORS

18 months' IBM 370/OS/VS1 experience. Subsidised canteen, sport and social club. 3 shifts.

KENT

£4000 +

DATA CONTROLLER

Flexi time, subsidised restaurant, mortgage facilities, relocation expenses. 2 yr. + IBM experience preferred.

SUSSEX

£4000

OPERATOR

IBM 370/OS/VS1 Operator 18 months + experience. Annual bonus, staff canteen.

E.C.3

£4300

SHIFT LEADER

Local job. 2 yrs. ICL 1900 GII operator experience. BUPA pension scheme, free meals.

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OPERATOR

9 month + experience ICL 1900 GII preferred. 2 shift system. Able to take responsibility.

SURREY to £3500 aae

SENIOR OPERATOR

12 hr. shifts. Excellent promotion prospects. ICL 1900 GII experience. 1 yr. +

E.C.1

£3500 +

SHIFT LEADER

Good operator with IBM system 3 experience. Staff canteen. Two shifts.

MIDDX.

£4400

هذا من الاجل

Reckitt & Colman Limited

U.K. Leisure Division

Systems Analyst

C. £6,500

The newly formed Leisure Division of Reckitt & Colman Limited is based at Winsor & Newton Limited in Wealdstone, Harrow, Middlesex. The Division is mainly involved in the manufacture and supply of art and craft materials and includes the world famous names of Winsor & Newton, Reeves, Dryad and Charles Page.

A Systems Analyst is required to work on a complete review of all systems in the operating companies. A minimum of two years systems experience is required, but the ability to work on own initiative and liaise at all levels within the division are of paramount importance. There will be deep involvement in projects from feasibility through to implementation.

If you have the necessary qualifications and would like to be considered for this position, please call in or phone for an Application Form. Ames Personnel, Suite 14, Dryden Chambers, 119 Oxford Street, London, W1R 1PA.

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The person (Male/Female) will be expected to control areas of the Company's business in an area north of the Midlands and will be directly responsible to the UK Sales Manager for the continuing business success in this area.

The successful person will probably possess a Degree or equivalent qualification and have experience in a technical sales environment. Experience in data processing or a computer related field is highly desirable. Proven field sales managerial experience is essential.

A basic salary commensurate with the responsibility of the position will be paid. A company car will be provided and the person will participate in a commission scheme.

An attractive contributory pension scheme is provided and assistance with relocation will be considered where appropriate.

Write with details of age, experience and current earnings to:

D. J. Kichenside,
Personnel Officer,
Racal-Milgo Ltd,
Prospect House,
Thorn Street, Reading, Berks.

SENIOR DATA CONTROL CLERK

c £4000 + Shift Allowance
WEST LONDON

A major brewery, based in West London and utilising twin ICL 1903Ts running under GLIS have a vacancy for a senior data control clerk.

The benefits, as one would expect from a company of this stature, are first class and include:

- ★ four weeks' holiday
- ★ excellent restaurant
- ★ new modern offices
- ★ ample car parking
- ★ free beer — of course!

You will have at least two years' experience of controlling computer input/output and be capable of maintaining magnetic tape records.

A sociable shift pattern of 7.30 a.m. to 3.30 p.m. and 11.30 a.m. to 7.30 p.m. is worked on alternate weeks.

Interested? then for further information and an application form contact our CROYDON office quoting ref. CW 20-BS.

01-686 9693 (24 HOUR ANSWERPHONE) 19, PARK STREET, CROYDON, CR9 1TN | 061 236 2419 FAULKNER HOUSE, FAULKNER STREET, MANCHESTER, M1 4YD

COMPUTER AND PERSONNEL CONSULTANTS **CAPP ASSOCIATES** Computing Services Association
LONDON AND MANCHESTER

GMC
Greater Manchester Council
COUNTY ENGINEER'S DEPARTMENT
URBAN TRAFFIC CONTROL SECTION
SENIOR PROGRAMMER
£3882/£5812 including supplements (pay award pending)

AN OPPORTUNITY FOR SOMEONE WITH EXPERIENCE OF CORAL AND/OR TRAFFIC CONTROL SOFTWARE TO ENJOY A MAJOR ROLE IN THE GREATER MANCHESTER URBAN TRAFFIC CONTROL SCHEME.

The Urban Traffic Control Systems Group is due to have a traffic control computer system using four Ferranti Argus 700 S Computers installed at the end of 1978. The period up to the acceptance of this system will be used to ensure that the software is rigorously tested before commencing on-line operation. Commissioning of the system to control some 630 traffic signals over most of the area of the County will follow.

The Group now needs a Senior Programmer initially to work alongside the contractor to aid in the software integration testing of the system, subsequently he/she will be initially involved in commissioning the operational system on-line. Substantial further development of the system will follow.

For the first 6-8 months, the person appointed will work at the contractor's facility at Wythenshawe; on delivery of the computer system the work will move into the UTC computer centre in the centre of Manchester adjacent to County Hall.

Attractive conditions of service include: removal, legal, etc. expenses up to £750; lodging allowance; flexible working hours; staff restaurant.

Applications by letter, stating full details including qualifications, experience, age, salary and home and addresses of two referees to the County Personnel Officer, County Hall, Manchester, M2 5PU by 3rd July 1978.

ASHFORD BOROUGH COUNCIL
TREASURER'S DEPARTMENT
Computer Operations Supervisor
required — Grade AP3/4
Salary £3395 to £4214 (including salary supplements)

This is a Joint Computer Unit, operated by Ashford Borough Council and Shepway District Council, which is located at Ashford with ICL 2803 computer.

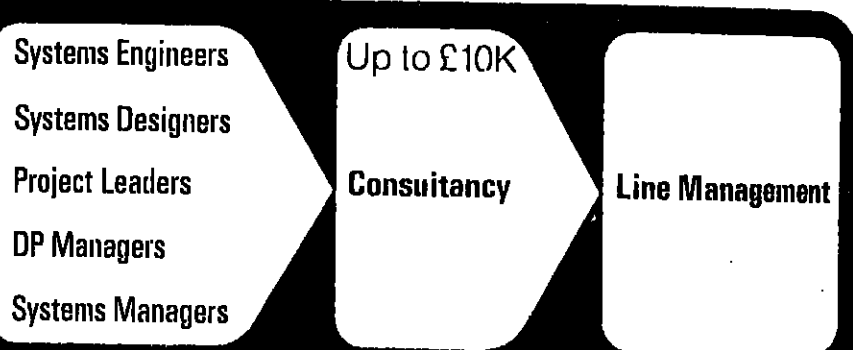
The job purpose is to control the day-to-day operations in the Computer Unit and to ensure prompt production of scheduled work. Duties include supervision and training of operations staff and controlling and scheduling of work to ensure the maximum use of the computer.

Excellent conditions of service include in appropriate cases:

- Council housing if required
- Removal expenses
- Settling in allowance of up to £100
- Assistance with professional fees in sale and house purchase up to £200
- Post entry training facilities available

Closing date — 13th July 1978

Application forms and Job Description available from: Chief Personnel Officer, 14/19 Church Road, Ashford, Kent, TN20 4JH or Ashford 24431, ext. 238.



This advertisement is addressed to Systems Engineers, Systems Designers, Project Leaders, Systems and DP Managers because most of our senior people left positions such as these to join us. We are still expanding rapidly and need to recruit staff aged between 25 and 35 to become consultants. We are in particular looking for people with in-depth business systems experience in the Insurance, Manufacturing, Distribution, and Transport industries. We are also looking for people with specialist skills in transaction-based systems, data base languages, terminal monitors and communication networks.

As a consultant you will be required to undertake a variety of different assignments. You will certainly need to manage projects and you will learn the unique Hoskyns structured approach to the management and control of computer projects. As a manager you will have full responsibility for keeping projects to schedule, within budget, and above all for producing consistently high quality work for our clients. Where necessary you will be trained in new techniques and developments.

Once you have proved your ability as a consultant, there are several different directions in which you could move. For example, you could become a Senior Consultant, responsible for major projects, a Project Manager, responsible for a number of consultancy and systems development projects, or you could take advantage of opportunities in other divisions of the Hoskyns Group, both in the U.K. and overseas. Hoskyns is part of an international group with sales in excess of £800 million.

If you would like to know more about the opportunities at Hoskyns, please send us a curriculum vitae or write or phone for an application form to:

Lynn Rogan,
John Hoskyns & Company Limited,
91-93 Farringdon Road, London EC1M 3LB,
Telephone: 01-242 1951

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A Systems Company with over 500 professional staff,
12 Computer Centres and 11 years of continuous growth.

Computer Technologist

— telecommunications facilities

Prece, Cardew & Rider are consulting engineers responsible for major projects both in the U.K. and overseas.

To assist in these telecommunications projects we require a specialist for the selection and application of relevant data processing equipment.

Primarily, the applications include:

- Directory enquiries
- Outside cable plant day-to-day operation and maintenance (generation of pair allocation and cross-connection data on a real-time basis).
- Computer-assisted operation and maintenance of long distance circuits, including real-time data retrieval and complex systems of selective data logging.
- Computer support for emergency services' control rooms.
- Automatic accounting for long distance telephone and telex calls (toll-ticketing).
- Conventional payroll and stock control systems.

The applicant should have several years' experience of hardware capability and software design directly relevant to the above and, most important, an ability to identify and analyse functional problems and communicate fluently. Some travel abroad will be necessary to liaise with clients, accept systems and advise on future applications and enhancements. Formal qualifications are desirable but not essential.

We offer an attractive starting salary and a full range of benefits — including generous overseas allowances and relocation assistance to this pleasant South Coast area as necessary.

Write in confidence for details giving concise history to:

The Personnel Manager, PCR Service Company,
Preston House, 165-167 Preston Road,
Brighton BN1 6AF,
Tel. Brighton 907131.

ANALYSTS and ANALYSTS/PROGRAMMERS and PROGRAMMERS SALARIES c£6,000 + SUBSTANTIAL FRINGE BENEFITS NORTH and EAST MIDLANDS

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YOU WILL WELCOME THE CHALLENGE OF WORKING IN A STIMULATING, PROFESSIONAL ENVIRONMENT WHERE YOUR OWN PERSONAL DEVELOPMENT IS ASSURED. YOU WILL BE GIVEN THE OPPORTUNITY TO IMPROVE YOUR TECHNICAL EXPERTISE AND TO BECOME TOTALLY INVOLVED IN THE DEVELOPMENT OF OUR CLIENTS PRODUCTS.

YOUR ABILITY AND HARD WORK WILL BE REWARDED BY HIGHLY COMPETITIVE SALARY STRUCTURES AND ADDITIONAL BENEFITS.

- ### POSITIONS AVAILABLE
- ★ SYSTEMS ANALYSTS to work on software systems development.
 - ★ COBOL/ASSEMBLER PROGRAMMERS to work on software applications development.
 - ★ PLAN PROGRAMMERS to work on software applications development.
 - ★ ASSEMBLER ANALYST/PROGRAMMERS to work on (a) technical services, (b) customer service, (c) field systems engineering.
 - ★ JUNIOR PROGRAMMERS to work on product quality assurance.

POSITIONS ENCOMPASS DEVELOPMENT ON IBM/ICL 1900/BURROUGHS/HARDWARE.

- ### IDEALLY YOU WILL HAVE:
- ★ one year's + ASSEMBLER programming experience gained in an IBM (or alternative machine environment). OR
 - ★ one year's + PLAN experience gained in an ICL environment, and a knowledge of GEORGE III.
 - OR
 - ★ two years' + COBOL experience gained ideally in an ICL 2900 series environment OR
 - ★ one year's + systems experience gained in any mainframe environment
 - ★ the necessary qualities and attitudes to work in close contact with clients
 - ★ the ability and desire to develop your skills and your career

THIS IS AN EXCITING OPPORTUNITY TO JOIN ONE OF EUROPE'S MOST SUCCESSFUL, WELL RESPECTED AND PROFESSIONAL SOFTWARE SERVICE COMPANIES. OUTSTANDING SUCCESS, COMBINED WITH EXTENSIVE DEVELOPMENTS WITHIN EUROPE, HAS NECESSITATED THE NEED TO EMPLOY FURTHER KEY PERSONNEL.

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LONDON 01-935 0671
Freeport 6, 102, Blandford Street,
London W1K 1JZ

Computing Services Association

Job 1 no 1/10

ANALYST/PROG HOLLAND

Our client, a major organisation meeting the ground power needs of world's airlines, by engineering a broad range of products to clients in more than 100 nations. Retaining Honeywell 62/40 under GCOS, they seek persons with 2-3 years' COBOL experience. Co. offers

- * Responsibility as the No. 2 to the D.P.M.
- * Lots of user liaison
- * Variety of interesting applications with Honeywell IMS package
- * Excellent fringe benefits
- * Salary DFL 42-48000 (£12,000)

Ref. 1538

SNR PROGRAMMER HOLLAND

Our client, a major company based in Holland, is engaged in the supplying of foodstuffs. They are seeking a senior programmer with at least 4 yrs COBOL experience. Applications include production control and accounting. They retain IBM 370 115 under DOS VS. Co. offers

- * Possibilities of travel throughout the Netherlands
- * Relocation expenses
- * English-speaking environment
- * Excellent career prospects
- * Salary to DFL 42,000 (£10,000)

Ref. 1547

PL/I PROGRAMMERS HOLLAND

Our client, a major and successful concern, wishes to strengthen its European programming team. Retaining IBM 370 hardware under DOS/VS, Co. seeks ambitious person with PL/I CICS or COBOL an asset. Co. offers

- * Involvement in development of new projects
- * Opportunity to work with an expanding organisation operating world wide
- * Centrally based - Amsterdam
- * Salary 40,000 Guilders (£10,000) cost of living allowance and relocation expenses

Ref. 1212

SYSTEMS ANALYST HOLLAND

International company engaged in manufacturing distribution and sales of well-known commercial products, requires person with experience of either inventory, stock control, warehousing or sales forecasting systems. Successful candidate will form the company's distribution project and will be responsible for management information reporting.

- * Excellent opportunity for career progression.
- * Relocation expenses
- * Company uses Siemens equipment compatible to IBM 370
- * Salary to 60,000 DFL (£15,000) + Bonus.

Ref. 1695

SNR ANALYST PROGRAMMER DUTCH/BELGIUM BORDERS

European division of American manufacturing seeks potential EDP Manager with personality, drive and enthusiasm for their PDP 11 installation. Applicant should have substantial amount of years in systems analysis and programming on PDP 11's with a good working knowledge of MUMPS. He/she will be involved in design and implementation of commercial and statistical systems integrated databases.

- * English-speaking co.
- * RSX11-M operating system planned for implementation early next year
- * Salary to DFL 55,000 (£14,000 approx).

Ref. 1545

ANALYST PROG HOLLAND

Our client, an international engineering company retaining IBM 370 hardware seeks an analyst programmer with minimum 3 years' COBOL experience. CICS VS would be an advantage. Company is situated in an historical University town close to Dutch/German border. Company offers

- * Relocation expenses
- * Working in new modern complex.
- * Excellent career prospects
- * Salary 40,000 Guilders (£10,000) + Bonus.

Ref. 1473

PROGRAMMERS MIDDLE EAST COUNTRIES

Our client is a major international organisation with offices throughout the world. They seek programmers and analysts in BAHRAIN & JEDDA where their market is growing strongly. Ideal applicants will have COBOL and/or NEAT experience on NCR small business machines to work on an interesting variety of projects in a financial and commercial environment.

- * Renewable one year permanent contract
- * Fully furnished accommodation provided at the company's expense.
- * 30 day LEAVE per annum.
- * Salary Paid in Bahrain Dollars £12,000 c. TAX FREE.

Ref. 1563

PROGRAMMER BELGIUM

Our client is a major organisation providing comprehensive marine engineering and construction services to companies engaged in Hydrocarbon development. Retaining IBM 370 under DOS/VS they seek a person with PL/I, RPG or ASSEMBLER an asset. Company offers

- * Variety of projects in rapidly expanding company.
- * Centrally based - BRUSSELS
- * English speaking environment.
- * Settling in allowance for married or single persons
- * Salary approx. £18,000 p.a.

Ref. 1447

SYSTEMS ANALYST LONDON

Our client, a prestigious Merchant Bankers, are seeking a Systems Analyst who has financial banking environment experience. They retain IBM 370 under OS but will consider other hardware experience. Co. offers

- * Full banking benefits including subsidised mortgage
- * Excellent working environment
- * Job security with prestige concern
- * Salary £7,500

Ref. 1594

SNR PROGRAMMER CITY

International financial concern retaining IBM 370 under OS are seeking a programmer with at least 3 years' COBOL experience. CICS would be an advantage, to become an ANALYST PROGRAMMER. This is a superb opportunity to train in analysis in a progressive organisation. Co. offers

- * Cheap mortgage
- * Non-contributory pension scheme/life assurance
- * Exciting and interesting future development work
- * Training in CICS
- * Great promotional prospects
- * Salary £8,500

Ref. 1593

SENIOR ANALYSTS MIDDX

Our client, a major organisation, situated close to both M4 and M3 motorways, is seeking a senior analyst to act as PROJECT MANAGER on a wide range of applications. If you have approx. 4 years experience preferably in ICL 1900 series environment, and are able to demonstrate a professional approach to project management apply NOW. Co. offers

- * Job security with a prestige concern
- * Responsibility
- * Excellent working conditions
- * FREE lunches, FREE life assurance
- * Salary £8,500 + COMPANY CAR

Ref. 1628

JNR PROGS LONDON

Challenging careers awaits persons with approx. 12 months' programming experience on ANY MACHINE. ANY LANGUAGE with drive and enthusiasm who wants to follow a positive career path. Opportunities as follows

- * TRAINING in PL and database
- * Development work on new sophisticated systems
- * Career progression with forward thinkers
- * Up to date technology
- * Salary to £4,500

Ref. 1550

ICL PROGS LONDON

Due to development of their advanced computer systems, successful D.P. services dept seeks to boost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with minimum 2 years' ICL COBOL experience. Co. offers

- * Opportunity to join at senior level
- * Training on IDMS database
- * Development to analysis
- * Applications in various areas providing an absorbing and interesting career
- * Excellent perks include flexi hours and 6 WEEKS' HOLIDAY
- * Salary £5,500

Ref. 1549

SYSTEMS ANALYSTS ESSEX

Our client, a sophisticated computer and technology company, has openings for systems analysts. Retaining Honeywell 68/20 under GCOS they will take people with any hardware experience. Ideal applicant will have good business background with drive and ambition. Co. offers

- * Exciting and interesting work in up-to-date technology
- * Subsidised lunch, pension scheme plus other company benefits
- * Excellent career prospects
- * Sports and social club
- * Salary to £6,500

Ref. 1585

PL/I PROGRAMMER W. LONDON AREAS

As part of a prestige international group of companies, our client is now recruiting for programmers with 2/3 years' PL/I exp. and hopefully some ASSEMBLER for the development of manufacturing systems on the IBM Series/1 mini computer.

- * Excellent opportunity to be trained on mini computer
- * Versatility of IBM Series/1 in relation to IBM mainframe
- * Working with up-to-date technology
- * Excellent career opportunities including chance of working with microcomputers
- * Salary to £7,000

Ref. 1597

JUNIOR PROG LONDON

Our client, a prestige commodity brokers with offices throughout the world, are seeking PL/I programmers. They retain IBM 370 hardware and if you have 1 or more years experience apply NOW for this fantastic opportunity. Co. offers

- * TRAINING in other high level languages
- * TRAINING in software
- * TRAINING in systems generation
- * Salary £4,500 to start

Ref. 1516

MINI PROGS HANTS

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Ref. 1588

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Ref. 1478

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Candidates seeking opportunity, security and large company benefits who meet the requirements should write for application form to:

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Applications are invited for a research post at University College London on a four-year programme of research on the economic impact of the distribution of income. The programme is financed by the ESRC and directed by Professor A. B. Atkinson of UCL. M. A. King, of Birmingham, and N. J. Smith, of Warwick, the work will involve a detailed analysis of the distribution of income, particularly the handling of large-scale survey data and previous experience in the use of econometric techniques will be valuable. The salary will be in the range £4,387 to £6,008, plus £480 London Allowance.

Further details may be obtained from Professor A. B. Atkinson (UCL), Dept. of Economics, University College London, Gower Street, London WC1E 6BT.

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The salary will be around £4,600 plus bonus, profit sharing, etc. There is scope for promotion.

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FERRANTI
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HERTS/MIDDLESEX NOTICE TO SYSTEMS ANALYSTS

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1. Introduction to Computing
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3. Operating Systems
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Applicants should send their curriculum vitae, together with a list of references, to the Secretary, The Institute of Oceanographic Sciences, Brook Road, Wormley, Godalming, Surrey GU8 5UB. (Telephone Wormley 0428 79) Quoting reference no 78/011/593. Closing date for applications 10 July 1978. NATURAL ENVIRONMENT RESEARCH COUNCIL

INSTITUTE OF OCEANOGRAPHIC SCIENCES SCIENTIFIC OFFICER/HIGHER SCIENTIFIC OFFICER NUMERICAL METHODS IN WAVE RESEARCH

The Institute of Oceanographic Sciences is undertaking its existing research into numerical modelling of the dynamics of high waves and is looking for someone with high ability in numerical analysis to work on this project.

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Application forms and further particulars are obtainable from:

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The Institute of Oceanographic Sciences
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Godalming
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(Telephone Wormley 0428 79) Quoting reference no 78/011/593. Closing date for applications 10 July 1978. NATURAL ENVIRONMENT RESEARCH COUNCIL

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GEMINI Recruitment

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth
Block 3 (The Inter-Block Gap)

Cleo has engineered Hex's release from captivity in Sprocket's Hole by having Bill Bootstrap's dope vector. Hex has hooked up Ascii over an asynchronous serial interface and is driving him by remote control for fear that his own logic circuits have been damaged.

As they veered and swerved their way from the log cabin, Hex several times turned Ascii in the wrong direction, bumping into Cleo, and once sent him charging full astern, breaking the data link and causing a costly delay while he ran back to retrieve the dog.

"It's not very easy steering him," Hex said defensively. "He investigates on polar co-ordinates, whereas I'm a Cartesian myself."

Cleo just rubbed her bruises in silence.

"This is not going very well," thought Hex. "I was supposed to be riding to her rescue on my shining charger but instead she rescued me, and now it looks as though I'm holding her back." Unfortunately the split-second lapse in concentration caused by this thought was enough to send Ascii plunging off the path again.

He careered wildly across the uneven ground and then juddered to a halt buried nose-deep in some loose gravel. Hex tugged at his tail while Cleo went round to his head and helped push. With some effort they managed to extricate him and roll him back onto the path.

Gradually Hex began to get the knack of controlling Ascii's four-wheel drive; and once they were out of sight of Sprocket's Hole he turned on the headlamps so that they could at least see where they were going. Their progress, which had been extremely erratic, began to pick up, and the tension between them eased. When he felt he had mastered the technique, he offered her a lift on Ascii's back.

"All right," she said, climbing aboard, "I'll try anything once."

"Ready?"

"Checks away!"

Hex revved Ascii up to full throttle, and let go of the brake. Ascii leapt forward, his wheels churning up a spray of dirt. Cleo hung on with one hand, waving the other above her head. She seemed to be enjoying her ride. Thus, with Hex cantering alongside, they bumped and jolted their way through the night, mostly uphill.

As dawn was breaking they came to the crest of yet another hill. They had now attained a height of 2,903 metres and on both sides the mountains of the southern Sierra Nueva (New Range) towered even higher. In front of them, stretched out in the sunrise, was a magnificent view over the fertile plain. Cleo dismounted and shook the dust from her dress. "Where do we go from here?" she asked.

"That's what we had better decide now," said Hex. "I think we should first find some shelter and maybe try to get some sleep. We're going to have to travel mainly by night so we might as well get used to sleeping in the daytime. We also need to devise a plan of action."

They moved off the trail and climbed a short distance into the hills. Hex had hoped to find a little cave or at least an overhanging ledge where they might be safe from observation, but before long they were met by a sheer wall of almost vertical rock.

Hex shrugged and, admitting defeat, began the difficult manoeuvre of turning Ascii through 180 degrees. But the dog's wheels bedded down into the scree, spinning uselessly. Hex wedged his shoulder under Ascii's chin and his legs firmly against the rock face and heaved for all he was worth.

Cleo heard a sharp crack then a loud grinding sound. She spun round to see Hex and Ascii disappearing beneath the surface of the earth. She rushed over and peered down into the hole into which they had vanished so suddenly.

"Are you all right?" she called.

Hex's answer echoed back: "Yes, come on in. It's just what we were looking for."

She lowered herself cautiously into the opening. Soon she too was sliding headlong down a long dark chute. Then she burst out into the light again at the mouth of the tunnel. Hex and Ascii lay spreadeagled on the ground.

On a bank of soft green moss just ahead of the point where she had come to rest. They were enclosed in the bowl of a small circular crater, possibly volcanic, with steep rock walls all round and a tiny lake, looking unnaturally blue, in the middle. Much of the crater's bed was covered in a bright green moss, and a single monkey-puzzle tree grew by the side of the pond.

Hex's eyes met hers. "I think I found an inter-block gap," he said, smiling.

"Not a bad little hiding place," she replied.

They rolled Ascii out into the sunshine to re-charge his solar cells, then went down to the water to drink. Cleo gulped it down greedily, though it was ice cold, for she was very thirsty. Having slaked their thirst, they returned to the side of the crater near the entrance tunnel and sat down.

"What shall I call you?" asked Cleo out of the blue.

"We've never been introduced. I know you're the Hexadecimal Kid; but that's a bit of a mouthful."

"Well, my friends call me Hex, but my real name is Samuel Synapse."

"I'm going to call you Sam then," she declared with deliberation.

"That suits me," he replied. "And what's your full name?"

"My full name is even fuller than yours, I'm afraid. My father was half Greek, you see. The part most people can pronounce is Cleopatra Calculus, but I'd prefer it if you'd just stick to Cleo. Now, if you don't mind, Sam, I'm going to get some sleep."

She turned over and curled up. Hex took off his greatcoat and spread it over her. So fast had she fallen asleep that she just mumbled a groggy thank-you without opening her eyes.

Sam Hex turned it over in his mind. A new name seemed as good a way as any to start a new role in life. But he was too sleepy to pursue that train of thought, and drifted off into unconsciousness.

Our three have found a resting place, but will they be able to get out again? More thrills and spills next week.

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BOOKS

Just two words—'good buy'

Introduction to Pascal, by C. A. G. Webster, 152 pp. £5.50. Heyden & Son, Spectrum House, Alderton Crescent, London NW4 3XX.

ALTHOUGH intended to be used as a textbook for a first course in computer programming, Mr Webster's book is equally applicable to the experienced reader.

The actual content is of an extremely high standard. The method of development of the language is well thought out and logical. It leads the reader through gradually expanding his or her view of the capabilities of Pascal.

Exercises are provided at the end of each chapter. Unfortunately solutions to selected examples only are provided. (Perhaps this is forgivable in what is primarily a course textbook.)

Structured programming is used throughout the book. The only criticisms I have to make are two, minor points. Firstly, chapter one

"The status of Pascal as a computer programming language", which puts it in context historically, would be better as an appendix. Secondly, there is the use of flowcharts. Surely in this day and age they have no place. In such a text!

To summarise: this is a book which I am proud to add to my collection. At £5.50 for a hard cover edition it is definitely a "Good Buy", especially in these days of escalating prices.

PETER WILLIAMS

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